

COURSE DESCRIPTIONS

1997 - 1998

Northeastern University
Boston, MA

GRADUATE SCHOOL OF ARTS AND SCIENCES

Digitized by the Internet Archive
in 2011 with funding from
Boston Library Consortium Member Libraries

Biology

BIO 3270 Diving Research Methods 4 QH
Focuses on research techniques in the study, ecology, and physiology of subtidal marine organisms. Topics include diving physiology, sampling design, statistical data analysis, under- water telemetry, underwater photography, and the use of underwater habitats and submersibles in research. Lab fee. *Prereq. Scuba certification.*

BIO 3313 Benthic Marine Ecology 4 QH
Examines the interactions among bottom-dwelling invertebrates, fish, and plants and their environment. Taken concurrently with BIO 3913 lab. *Prereq. BIO 1222, 1611; BIO 1343, 1641 recommended.*

BIO 3316 Marine Microbial Ecology 4 QH
Examines the diversity of marine microorganisms and recent advances in the area of microbial ecology. Emphasizes the structure and function of microbial food webs in marine communities. Taken concurrently with BIO 3916 lab.

BIO 3331 Marine Botany 4 QH
Explores taxonomy of the major groups of marine plants, primarily algae. Investigates ecological and reproductive strategies, economic importance, and roles in diverse marine communities. Mandatory field trips. Taken concurrently with BIO 3931 lab.

BIO 3343 Tropical Terrestrial Ecosystems 2 QH
Introduces students to the plants, animals, and ecosystems of terrestrial Jamaica. East/West program.

BIO 3344 Vertebrate Paleontology 4 QH
Examines evolution of the vertebrates, including humans, as revealed through the fossil record. *Prereq. BIO 1222, 1611 BIO 1282, 1660; or permission of instructor.*

BIO 3348 Embryology 4 QH
Topics include gametogenesis, fertilization, cleavage, gastrulation, induction, organogenesis, and metamorphosis in vertebrates. Taken concurrently with BIO 3948 lab. *Prereq. BIO 1282, 1660.*

BIO 3350 Marine Birds and Mammals 4 QH
Focuses on the phylogeny, systematics, zoogeography, morphology, physiology, reproduction, behavior, and

ecology of birds and mammals associated with the marine environment along the New England coast. Taken concurrently with BIO 3950 lab. *Prereq. BIO 1222, 1611.*

BIO 3352 Comparative Vertebrate Anatomy 4 QH
Focuses on morphology and phylogeny of the vertebrates. Taken concurrently with BIO 3952 lab. *Prereq. BIO 1101 or BIO 1109.*

BIO 3361 Parasitology 4 QH
Focuses on symbiotic relationships of protozoans, mesozoans, flatworms, nematodes, acanthocephalans, and arthropods. Taken concurrently with BIO 3961 lab. *Prereq. BIO 1282, 1660.*

BIO 3389 Marine Invertebrate Zoology 4 QH
Topics include functional morphology, systematics, ecology, and phylogenetic relationships of the major invertebrate phyla. Taken concurrently with BIO 3989 lab. *Prereq. BIO 1101 or BIO 1109.*

BIO 3390 Ocean and Coastal Processes 1 4 QH
The first of a series of three courses intended to introduce the student to a wide range of coastal environments. Includes studies of the open ocean, rocky intertidal areas, sandy beaches, and estuarine environments of the Washington coast. Demonstrates basic biological principles through comparative studies. Taken concurrently with BIO 3990 lab.

BIO 3391 Ocean and Coastal Processes 2 4 QH
The second of a series of three courses intended to introduce the student to a wide range of coastal environments. Includes studies of the open ocean, rocky intertidal areas, sandy beaches, and estuarine environments of the Caribbean. Demonstrates basic biological principles through comparative studies. Taken concurrently with BIO 3991 lab.

BIO 3392 Ocean and Coastal Processes 3 4 QH
The third of a series of three courses intended to introduce the student to a wide range of coastal environments. Includes studies of the open ocean, rocky intertidal areas, sandy beaches, and estuarine environments of the New England coast. Demonstrates basic biological principles through comparative studies. Taken concurrently with BIO 3992 lab.

BIO 3395 Biology and Ecology of Fishes 4 QH
Examines the ecology, evolution, systematics, and behavior of fish. Studies specimens taken from New England waters. Taken concurrently with BIO 3995 lab.

BIO 3397 The Biology of Corals and Coral Reefs 4 QH

Concentrates on tropical crudaria and studies the systematics, anatomy, physiology and ecology of this group of animals which assume such an important role in tropical marine ecosystems. Taken concurrently with BIO 3997 lab.

BIO 3398 The Biology of Fishes 4 QH

A field, lecture, and lab course that examines the systematics, anatomy, behavior and ecology of fish. Tropical forms are emphasized. Taken concurrently with BIO 3998 lab.

BIO 3399 Adaptations of Aquatic Organisms 4 QH

Explores aquatic organisms through a study of their evolutionary responses to the aquatic habitat. Considers the physical properties of water that have affected form, function, and behavior of all aquatic organisms. Uses density, viscosity, diffusion rates, pressure effects, and elementary fluid mechanics to explain such characteristics as the body shape of larvae, hearing and sound production, suspension feeding, and buoyancy. Offered at Marine Science Center in Nahant. Taken concurrently with BIO 3999 lab. *Prereq. Two years of college biology.*

BIO 3412 Evolution 4 QH

Discusses history of evolutionary theory and lines of evidence. Emphasis is place on mechanisms of speciation. Current evolutionary topics are introduced and discussed. Taken concurrently with BIO 3912 lab. *Prereq. BIO 1222, 1611 and BIO 1282, 1660.*

BIO 3421 Microbial Physiology 4 QH

Focuses on structure and function of the bacterial cell, emphasizing its general properties as well as on the physical and chemical factors that influence it. May be taken concurrently with BIO 3921 lab. Lab is optional. *Prereq. BIO 1323, 1623 or equiv.*

BIO 3428 Medical Microbiology 4 QH

Topics include host parasite interactions: virulence, toxins, natural flora, immunological responses; characteristics of the common bacterial, rickettsial, and protozoal infections in humans; epidemiology, pathology, vaccines, and chemotherapy. Taken

concurrently with BIO 3928 lab. *Prereq. BIO 1323, 1623 or equiv.*

BIO 3433 Higher Plants 4 QH

The theme of the course is the origin and evolution of land plants. The invasion of the land surface by plants, particularly vascular plants, occurred in late Silurian and early Devonian time, approximately 405 to 370 million years ago. The flora that covers Planet Earth today is vastly different from the flora of those early geological days. What were the early land plants like? How did they evolve into the complex land plant flora that we see today? Which taxa have survived unaltered until present day? How did seed-bearing plants develop? What is the nature of the complex reproductive structure we call the flower? These questions and others are the focus of this course on higher land plants? Taken concurrently with BIO 3933 lab. *Prereq. BIO 1102, 1602.*

BIO 3438 Plant Development 4 QH

Examines the structural and molecular aspects of plant development beginning with the fertilization apparatus of higher plants and the development of the embryonic plant. The structure and development of the vegetative and reproductive organs of the plant will be studied and advances in the fields of cellular and molecular biology will be applied to the interpretation of plant development. Students will progress from learning fundamental information on each topic through reading contemporary research papers. Taken concurrently with BIO 3938 lab. *Prereq. BIO 1100, 1600.*

BIO 3450 Immunology 4 QH

Provides an overview of the structure and function of genes, proteins, and cells involved in the generation of the immune response. Emphasizes molecular immunology and immunogenetics. *Prereq. BIO 1283, 1661. May be taken concurrently with BIO 3565.*

BIO 3456 Vertebrate Endocrinology 4 QH

Studies principles of hormonal regulation of physiological processes in vertebrates, mechanisms of hormone action, and neuroendocrine relationships. *Prereq. Biochemistry.*

BIO 3458 Neuroethology 4 QH

Concentrates on the mechanisms underlying behavior of model invertebrates and lower invertebrates. Aims to develop a framework to explain behavior in terms of properties and connectivity of neuronal circuits. Topics to be covered include: The cellular biology of neurons and neuronal circuits, and the organization of

sensory and motor systems. Taken concurrently with BIO 3958 lab. *Prereq.* BIO 1102, 1602.

BIO 3465 Advanced Immunology 3 QH
Presents, critically reviews, and discusses current concepts in immunological research within the context of the field of immunology. *Prereq.* BIO 3450.

BIO 3467 Herpetology 4 QH
Lectures emphasize the natural history, behavior, systematics, and zoogeography of recent amphibians and reptiles. Lab consists of identification and preparation of specimens, particularly local species. Mandatory field trips. Taken concurrently with BIO 3967 lab. *Prereq.* BIO 1282, 1660.

BIO 3468 Mammalogy 4 QH
Anatomy, physiology, behavior, ecology and systematics of mammals are presented and discussed. Laboratories involve study of specimens, museum preparation, and field collection, including a week-end field trip. Taken concurrently with BIO 3968 lab. *Prereq.* BIO 1222, 1611.

BIO 3501 Biological Laboratory Computing 4 QH
Introduces students to the basic techniques of interfacing biological experiments to computers, using lectures that present problems to be solved by applying contemporary microcomputing devices. Surveys the architecture of a lab computing system; discusses problems inherent in applying contemporary lab input/output devices; and provides the background in graphics and database management necessary for generating reports.

BIO 3509 Principles of Systematics 4 QH
Surveys the theories and techniques employed in plant and animal systematics and the rules according to the International Codes of Zoological and Botanical Nomenclature.
Prereq. Permission of instructor.

BIO 3510 Environmental and Population Biology 2 QH
Ecology; Considers physical and chemical factors of the environment as they affect the distribution of organisms and as they may in turn be affected by the organisms. Includes population dynamics, species interactions, population genetics (lightly), the development of communities, and the structure and function of ecosystems. No lab component. Open to graduate students completing deficiencies in entrance requirements. *Prereq.* One year of general biology, including plant and animal biology.

BIO 3512 River Ecology Laboratory 3 QH
Comprises two four-hour sessions per week (combined lecture and lab). Covers chemical determinations, measurement of primary and secondary production, and organismal identification in flowing waters of different types. Lab fee. *Prereq.* BIO 3516.

BIO 3514 Salt Marsh Ecology 3 QH
Studies the mechanisms of salt marsh formation including major plants and the factors affecting distribution; the distribution and interaction of animals; productivity; and food webs and energy flow. Discusses the relationship of marsh to bay in the estuarine system, marsh pools as a sub-habitat, and the effect of people using the tidal marsh. *Prereq.* BIO 3510 or equivalent.

BIO 3515 Salt Marsh Ecology Lab 2 QH
Focuses on the distribution, feeding habits, productivity and ecology of the major plants and animals of marsh surfaces and pools. *Prereq.* BIO 3514.

BIO 3516 Aquatic Ecology 4 QH
Studies rivers, lakes, and estuaries. Focuses on physical and chemical factors, seasonal and regional variations of these factors, interactions between these factors and the effects on the biotic community. Examines examples of current and classical ecological research in each of the three aquatic communities. *Prereq.* BIO 3510 or equivalent.

BIO 3523 Environmental Microbiology 4 QH
Studies the microbial environment and ecology of the cell. Explores interactions between microbial populations, stressing soil and fresh water associations. *Prereq.* BIO 1323, 1623.

BIO 3540 Advanced Invertebrate Zoology 4 QH
A lecture course that concentrates on one or two phyla. Subject varies from year to year, depending upon expertise of available faculty. Taken concurrently with BIO 3940 lab. *Prereq.* BIO 3389, 3989.

BIO 3541 Vertebrate Zoology 4 QH
Surveys the diversity, systematics, anatomy, physiology, and ecology of all vertebrate classes of New England. Taken concurrently with BIO 3941 lab. *Prereq.* BIO 1282, 1660.

BIO 3542 Biology of Microcrustacea 4 QH
Systematics, morphology, and biology of the smaller Crustacea. Decapoda, Stomatopoda and Cirripedia

are mostly excluded. Accent on non-malacostracan orders, but includes those malacostracan taxa dominated by small forms. Taken concurrently with BIO 3942 lab. *Prereq.* BIO 1222, 1611.

BIO 3545 Wildlife Biology 4 QH
Concepts and techniques utilized in the conservation and study of wild vertebrate animals are presented in lecture and weekly field trips. Subjects include habitat management, endangered species, non-native species, zoonoses, financing and legislation. Taken concurrently with BIO 3945 lab. *Prereq.* BIO 3510 and BIO 3468, 3968 or BIO 3546, 3946..

BIO 3546 Ornithology 4 QH
Anatomy, physiology, behavior, ecology, and systematics of birds are presented and discussed. Taken concurrently with BIO 3946 lab. *Prereq.* BIO 1222, 1611.

BIO 3547 Biomechanics 1, Theory 4 QH
Introduces engineering theory and techniques as applied to the disciplines of morphology, evolution, and ecology. Includes material properties, structural elements and systems, and elementary fluid dynamics. Lab emphasizes biological materials in a mechanical sense, the physical biology of flow, and an examination of the fundamental principles of physical laws that affect living organisms. *Prereq.* *Permission of instructor.*

BIO 3548 Biomechanics 2, Applications 4 QH
Presents a forum for research in biomechanics in which students are expected to develop and execute a research project. In addition, current areas of a research project. In addition, current areas of biomechanical research will be reviewed and evaluated. *Prereq.* BIO 3547 and permission of instructor.

BIO 3560 Genetics and Developmental Biology 2 QH
Elaborates the classic laws of heredity, including cytogenetics and chemical basis of heredity. Presents selected examples of the development of form and function. Requires that students participate in lectures and labs given for BIO 1282 and perform extra individual work. Open to graduate students completing deficiencies in entrance requirements. *Prereq.* General biology.

BIO 3561 Introductory Biochemistry 2 QH
Topics include structure and function of biomolecules, central concepts of bioenergetics and thermodynamics, enzyme kinetics and regulation, and

metabolic pathways. Open to graduate students completing deficiencies in entrance requirements. No lab component. *Prereq.* General biology, college physics, and organic chemistry.

BIO 3563 General Biochemistry Laboratory 4 QH
Introduces modern research techniques used in biochemistry and molecular biology. Topics include purification and characterization of proteins, kinetic properties of enzymes, isolation of high molecular weight DNA, recombination of DNA molecules in vitro, isolation of bacterial clones containing recombinant molecules, and in vitro mutagenesis. The course includes two hours of lecture and seven hours of lab. *Prereq.* *Permission of instructor.*

BIO 3564 General Biochemistry 4 QH
Surveys biochemistry, emphasizing protein structure, the nature of enzymic catalysis, bioenergetics, and the metabolism of carbohydrates, lipids, amino acids, and nucleotides. *Prereq.* Organic chemistry and introductory biochemistry or equiv.

BIO 3565 Molecular Biology 4 QH
Studies current theories of the detailed molecular mechanisms for the preservation, expression, and evolutionary development of biological information. Emphasis on experimental design and proof in macromolecular chemistry and genetics. *Prereq.* BIO 3564 or equiv..

BIO 3566 Cellular Biochemistry 4 QH
Emphasizes the structure and function of organelles, mechanisms of signal transduction, and regulation of gene expression. *Prereq.* BIO 3564 and 3565 or equiv.

BIO 3577 Malacology 4 QH
Investigates functional morphology, embryology, systematics, and ecology of major groups of mollusks. *Prereq.* Invertebrate zoology.

BIO 3579 Physiology and Biomechanics of Animal Activity 4 QH
Offers an integrated study of the physiological and biomechanical systems that support locomotory activity in animals. The first part is devoted to the structure and function of skeletal muscle and to respiratory and cardiovascular adaptations for activity. The remainder integrates physiological and biomechanical information related to flying, swimming, and terrestrial locomotion. *Prereq.* General Physiology.

BIO 3580 Molecular Marine Botany 4 QH

Examines the application of biochemical and molecular approaches to ecological, systematic, and evolutionary studies of marine algae. Explores experimental methods including isoenzyme electrophoresis and DNA restriction fragmentation analysis. Discusses modern concepts in population genetics and evolutionary biology. Requires research projects. Taken concurrently with BIO 3980 lab.

BIO 3584 Systems Physiology 4 QH

Covers function and regulation of major physiological systems in animals including energy metabolism, thermoregulation, muscle and movement, circulation, respiration, salt and water balance, and circadian rhythms. Emphasis is on vertebrates, but material on invertebrates will be included where appropriate. Taken concurrently with BIO 3984 lab. *Prereq.* BIO 1283, 1661 or 1355, 1655 or permission of instructor.

BIO 3601 Biological Electron Microscopy 4 QH

Presents techniques of electron microscopy applied to biological materials. Discusses specimen preparation, fixation, thin-sectioning, staining, operation of electron microscope, photographic techniques, and interpretation of electron micrographs. Requires student seminars and project. *Prereq.* Permission of instructor.

BIO 3606 Advanced Developmental Biology 4 QH

Studies current concepts of animal and plant development at the molecular and physiological levels. Topics include nucleic acid and protein synthesis in development, metabolic activation at fertilization, regulation of the eukaryotic genome, control of cell differentiation, and molecular communication between cells. Stressed reading and interpretation of the primary literature.

BIO 3611 Cellular Aspects of Development 4 QH

Studies animal and plant development at the cellular level. Topics include cell-cell interaction, cell surface differentiation, differential cell adhesion, genetic and epigenetic control or pattern formation, and ultra-structural aspects of fertilization and development. Stresses reading and interpretation of the primary literature.

BIO 3615 Developmental Neurobiology 4 QH

Provides an overview of developmental neurobiology, focusing on mechanisms for the formation and differentiation of nervous systems and nerve cells. Examines the relationship between nervous system development and behavior development. Topics

include the early formation of nervous systems, pattern formation, neural movement and migration, growth and differentiation of nerve cells, formation of specific synaptic connections between cells, neural plasticity, and modification of neural organization by the environment. Topics not restricted to the embryology of any particular animal group (for example, vertebrates or invertebrates), but organized around the variety of animals and experimental preparations used to study neural development mechanisms.

Prereq. Comparative Neurobiology.

BIO 3622 Industrial Microbiology 4 QH

Microbiology applied to biotechnology. Physiological and genetic manipulation of microorganisms for the production of economically and medically important products from microbial and nonmicrobial sources, such as enzymes, amino acids, antibiotics, nucleotides, human and animal proteins. Background in Microbiology and Molecular Biology equivalent to BIO 3421 and BIO 3565 is expected.

BIO 3641 Biological Clocks 4 QH

Examines the expression of endogenously generated 24-hour (circadian) rhythms in eukaryotic life, emphasizing theoretical foundations as well as current research strategies for understanding how biological clocks work. Presents analytic principles essential for understanding biological rhythmicity in any organism at any level of organization. Emphasizes strategies used to understand the concrete mechanisms underlying biological rhythmicity.

BIO 3653 Comparative Neurobiology 4 QH

Presents a cellular approach to structure and function of the nervous system. Topics include neuronal anatomy, cellular properties of single neurons, synaptic transmission, integration in nerve cells, nerve networks, sensory systems, motor systems, sensory-motor integration, specification of neuronal connectivity, and phylogeny of nervous systems. *Prereq.* General (animal) physiology.

BIO 3667 Biology Laboratory Rotation I 3 QH

Offers experience in biology research in a faculty research laboratory. Intended only for students who have not yet chosen a lab in which to carry out thesis work.

BIO 3668 Biology Laboratory Rotation II 3 QH

Offers a second quarter of research experience in a different laboratory than that for BIO 3667. Intended

only for students who have not yet chosen a lab in which to carry out thesis work.

BIO 3669 Biology Laboratory Rotation III 3 QH
Offers a third quarter of research experience in a different laboratory than that for BIO 3667 or 3668. Intended only for students who have not yet chosen a lab in which to carry out thesis work.

BIO 3680 Advanced Topics in Biochemistry 3 QH
Selected advanced topics in the area of biochemistry; topics will vary from year to year.

BIO 3681 Advanced Topics in Molecular Biology 3 QH
Selected advanced topics in the area of molecular biology; topics will vary from year to year.

BIO 3682 Advanced Topics in Cell Biology 3 QH
Selected advanced topics in the area of cell biology; topics will vary from year to year.

BIO 3683 Advanced Topics in Ecology 3 QH
Selected advanced topics in the area of ecology; topics will vary from year to year.

BIO 3684 Advanced Topics in Systematics and Evolution 3 QH
Selected advanced topics in the area of systematics and evolution; topics will vary.

BIO 3685 Advanced Topics in Physiology 3 QH
Selected advanced topics in the area of physiology; topics will vary from year to year.

BIO 3686 Advanced Topics in Marine Biology 3 QH
Selected advanced topics in the area of marine biology; topics will vary from year to year.

BIO 3690 Seminar 1 QH
Examines various topics and recent developments in botany, biochemistry, microbiology, molecular biology, physiology, and zoology in depth. Emphasizes student presentations. To facilitate the planning of assignments, students are urged to contact the instructor during the quarter before the seminar is to be offered.

BIO 3699 Doctoral Dissertation 0 QH
Requires original research in depth, representing a significant contribution of new biological knowledge, and a written dissertation thereon, under the supervision of a graduate faculty member.

BIO 3731 (1 QH), BIO 3732 (2 QH), BIO 3733 (3 QH), BIO 3734 (4 QH)
Master's Literature Dissertation
Focuses on extensive research of the primary literature under direction of a graduate faculty member, leading to a comprehensive written review of a significant biological problem and an oral examination.

BIO 3741 (1 QH), BIO 3742 (2 QH), BIO 3743 (3 QH), BIO 3744 (4 QH)
Doctoral Research
Presents research methods and their application to a specific problem, under the direction of a graduate faculty member.

BIO 3751 (1 QH), BIO 3752 (2 QH), BIO 3753 (3 QH), BIO 3754 (4 QH)
Directed Readings in Biology
Readings from current literature on an area of interest to students and faculty.

BIO 3761 (1 QH), BIO 3762 (2 QH), BIO 3763 (3 QH), BIO 3764 (4 QH)
Master's Research
Presents research methods and their application to a specific problem, under the direction of a graduate faculty member. This research may take the form of the thesis research, research preliminary to the thesis, or research on a selected topic not directly related to the thesis.

BIO 3790 Perspectives in Biology 1 QH
Discusses current developments in one of the fields of biology. Each weekly meeting will focus on a presentation by an invited expert. In-class discussion must be supplemented by written assignments. No more than 2 QH of this course may be applied to satisfy the 4 QH seminar requirement for the MS degree.

BIO 3798 Master's Continuation 0 QH

BIO 3799 Doctoral Dissertation Continuation 0 QH

BIO 3912 Evolution Lab 1 QH
Laboratory taken concurrently with BIO 3412. Laboratory involves students in library research. Lab fee.

BIO 3913 Benthic Marine Ecology Lab 1 QH
Laboratory taken concurrently with BIO 3313. Quantitative field methods and new developments in ecological theory will be applied to examinations of

the rocky intertidal zone, soft sediment areas, salt marshes, and the rocky subtidal zone. Lab fee.

BIO 3916 Marine Microbial Ecology Lab 1 QH
Laboratory taken concurrently with BIO 3316. Lab fee.

BIO 3921 Microbial Physiology Lab 1 QH
Laboratory taken concurrently with BIO 3421. Lab fee.

BIO 3923 Environmental Microbiology Lab1 QH
Laboratory taken concurrently with BIO 3523. Lab fee.

BIO 3928 Medical Microbiology Lab 1 QH
Laboratory taken concurrently with BIO 3428. Lab fee.

BIO 3931 Marine Botany Lab 1 QH
Laboratory taken concurrently with BIO 3331. Lab fee.

BIO 3933 Higher Plants Lab 1 QH
Laboratory taken concurrently with BIO 3433. Lab fee.

BIO 3938 Plant Development Lab 1 QH
Laboratory taken concurrently with BIO 3438.
Student projects will be the focus of the laboratory. Lab fee.

BIO 3940 Advanced Invertebrate Zoology Lab 1 QH
Laboratory taken concurrently with BIO 3540.
Individual research project. Lab fee.

BIO 3941 Vertebrate Zoology Lab 1 QH
Laboratory taken concurrently with BIO 3541. Lab consists of field observations, museum trips, and specimen study. Lab fee.

BIO 3942 Biology of Microcrustacea Lab 1 QH
Laboratory taken concurrently with BIO 3542. Lab fee.

BIO 3945 Wildlife Biology Lab 1 QH
Laboratory taken concurrently with BIO 3545.
Concepts and techniques utilized in the conservation and study of wild vertebrate animals are presented in lab. Lab fee.

BIO 3946 Ornithology Lab 1 QH
Laboratory taken concurrently with BIO 3546. Lab includes study of specimens and field identification. Lab fee.

BIO 3948 Embryology Lab 1 QH
Laboratory taken concurrently with BIO 3348.
Emphasis is on frog, chick, and pig. Lab fee.

BIO 3950 Marine Birds and Mammals Lab1 QH
Laboratory taken concurrently with BIO 3350. Lab emphasis is on species that occur along the New England coast. Lab fee.

BIO 3952 Comparative Vertebrate Anatomy Lab 1 QH
Laboratory taken concurrently with BIO 3352.
Studies the taxonomy of the vertebrates and specific morphology of the dogfish shark, mud puppy, alligator, and cat. Lab fee.

BIO 3958 Neuroethology Lab 1 QH
Laboratory taken concurrently with BIO 3458. Lab fee.

BIO 3961 Parasitology Lab 1 QH
Laboratory taken concurrently with BIO 3361. Lab fee.

BIO 3967 Herpetology Lab 1 QH
Laboratory taken concurrently with BIO 3467. Lab consists of identification and preparation of amphibians and reptiles, particularly local species. Lab fee.

BIO 3968 Mammalogy Lab 1 QH
Laboratory taken concurrently with BIO 3468.
Laboratories involve study of specimens, museum preparation, and field collection, including a week-end field trip. Lab fee.

BIO 3980 Molecular Marine Botany Lab 1 QH
Laboratory taken concurrently with BIO 3580. Lab fee.

BIO 3984 Systems Physiology Lab 1 QH
Laboratory taken concurrently with BIO 3584. Lab fee.

BIO 3989 Marine Invertebrate Zoology Lab1 QH
Laboratory taken concurrently with BIO 3389.
Emphasizes utilization of living marine forms, with dissection of representative organisms. Lab fee.

BIO 3990 Ocean & Coastal Processes 1 1 QH
Laboratory taken concurrently with BIO 3390. Lab fee.

BIO 3991 Ocean & Coastal Processes 2 1 QH
Laboratory taken concurrently with BIO 3391. Lab fee.

BIO 3992 Ocean & Coastal Processes 3 1 QH
Laboratory taken concurrently with BIO 3392. Lab fee.

BIO 3995 Biology & Ecology of Fishes Lab 1 QH
Laboratory taken concurrently with BIO 3395.
Studies specimens taken from New England waters. Lab fee.

BIO 3997 Biology of Corals and Coral Reefs 1 QH
Laboratory taken concurrently with BIO 3397. Lab fee.

BIO 3999 Adaptations of Aquatic Organisms 1 QH
Laboratory taken concurrently with BIO 3399. Lab fee.

Interdisciplinary Courses

INT 3101 Biochemistry 1 (taught by Chemistry dept.) 3 QH

INT 3102 Biochemistry 2 3 QH
Discusses enzymes, enzyme kinetics, and mechanisms of enzyme reactions, of intermediary metabolism and of bioenergetics, biological oxidation-reduction reactions and the electron transport chain. Considers carbohydrate metabolism including the glycolytic pathway, the citric acid cycle and the pentose phosphate pathway. *Prereq. INT 3101.*

INT 3103 Biochemistry 3 3 QH
Continuation of intermediary metabolism from INT 3102, including lipid, protein, and nucleic acid metabolism, photosynthesis, and cell regulation. *Prereq. INT 3101.*

INT 3580 Physical Biochemistry 4 QH
Examines physicochemical principles as they apply to biological processes. Topics include chemical equilibria, reaction kinetics, basic thermodynamics, oxidation-reduction reactions and bioenergetics, and transport. Emphasizes problem solving as a tool for learning, using a quantitative approach. Explains basic assumptions and limitations underlying principles; for the most part, however, rigorous derivations are avoided. Makes applications to basic experimental techniques in biochemistry by way of relevant biochemical examples. *Prereq. BIO 1283, 1661.*

Chemistry

All courses carry three quarter-hours of credit unless otherwise specified.

I. Introductory Courses

CHM 3231 Analytical Chemistry 1 QH
Introduces analytical chemistry to students whose background in the subject is deemed inadequate. *Prereq. Permission of the departmental academic standing committee.*

CHM 3271 Organic Chemistry 1 1 QH
Introduces organic chemistry to students whose background in the subject is deemed inadequate. *Prereq. Permission of the departmental academic standing committee.*

CHM 3272 Organic Chemistry 2 1 QH
Continues CHM 3271. *Prereq. Permission of the departmental academic standing committee.*

CHM 3273 Organic Chemistry 3 1 QH
Continues CHM 3272. *Prereq. Permission of the departmental academic standing committee.*

CHM 3381 Physical Chemistry 1 1 QH
Offers a beginning course in physical chemistry concentrating on chemical thermodynamics for students whose background in the subject is deemed inadequate. *Prereq. Permission of the departmental academic standing committee.*

CHM 3382 Physical Chemistry 2 1 QH
Continues CHM 3381. Concentrates on phase equilibria, solutions, kinetic theory of gases, and chemical kinetics. *Prereq. Permission of the departmental academic standing committee.*

CHM 3383 Physical Chemistry 3 1 QH

Offers a beginning course in physical chemistry, concentrating on quantum chemistry, particles and waves, and Schrodinger wave mechanics for students whose background in the subject is deemed inadequate. *Prereq. Permission of the departmental academic standing committee.*

CHM 3431 Instrumental Analysis 1 QH

Offers a beginning course in instrumental analysis for students whose background in the subject is deemed inadequate. *Prereq. Permission of departmental academic standing committee.*

CHM 3441 Inorganic Chemistry 1 QH

Offers a beginning course in inorganic chemistry for thesis students whose background in the subject is deemed inadequate. *Prereq. Permission of departmental academic standing committee.*

CHM 3461 Identification of Organic Compounds 1 QH

Offers a beginning course in the identification of organic compounds dealing with qualitative analysis of organic compounds and mixtures, using physical methods. Designed for students whose background in the subject is deemed inadequate. *Prereq. Permission of departmental academic standing committee.*

CHM 3510 Special Projects in Chemistry 4 QH

Offers lab studies for non thesis research. *Prereq. Permission of departmental academic standing committee.*

II. Required Regular Courses

CHM 3511 Analytical Separations

Describes the theory and practice of separating the components of complex mixtures in the gas and liquid phase. Methods to enhance separation efficiency and detection sensitivity are also included. The course includes thin-layer, gas and high-performance liquid chromatography (HPLC) and recently developed techniques based on HPLC, including capillary and membrane-based separation, and capillary electrophoresis.

CHM 3512 Principles of Mass Spectrometry

Describes the theory and practice of ion separation in electrostatic and magnetic fields and their subsequent detection. Topics covered include: Basic principles of ion trajectories in electrostatic

and magnetic fields, design and operation of inlet systems and electron impact ionization, mass spectra of organic compounds.

CHM 3513 Optical Methods of Analysis

Describes the application of optical spectroscopy to qualitative and quantitative analysis. Course includes the principles and application of emission, absorption, scattering and fluorescence spectroscopies, spectrometer design, elementary optics and modern detection technologies.

CHM 3514 Electroanalytical Chemistry

Describes the theory of electrode processes and modern electroanalytical experiments. Topics include: the nature of the electrode-solution interface (double layer models), mass transfer (diffusion, migration, and convection), types of electrodes, reference electrodes, junction potentials, kinetics of electrode reactions, controlled potential methods (cyclic voltammetry, chronoamperometry), chronocoulometry and square wave voltammetry and controlled current methods (chronopotentiometry).

CHM 3546 Synthesis and Reactivity of Inorganic Compounds

Topics include: Basic concepts of molecular topologies, coordination compounds, coordination chemistry, isomerism, electron transfer reactions, substitution reactions, molecular rearrangements and reactions at ligands, biochemical applications.

CHM 3547 Physical Methods in Chemistry

Introduction to resonance spectroscopy, electronic absorption spectroscopy, electronic states and structure, NMR spectroscopy: concentrates on interpretation and origin of inorganic nuclei e.g. ^{31}P , ^{11}B not proton; fluxionality, EPR: interpretation of ESR spectra with respect to the structure of inorganic compounds, magnetic measurements.

CHM 3566 Organic Synthesis 1

Surveys types of organic reactions, including stereochemistry, influence of structure and medium, mechanistic aspects, and synthetic applications. *Prereq. One year of organic chemistry.*

CHM 3567 Mechanistic and Physical Organic Chemistry 1

Examines relation of experimental properties to orbital concepts, aromaticity and antiaromaticity, pericyclic reactions, and photochemistry. *Prereq. CHM 3666 or permission of instructor.*

CHM 3569 Spectroscopy of Organic Compounds
Structure determination based on mass, infrared, proton and carbon nuclear magnetic resonance spectra of organic compounds. *Prereq.* One year of organic chemistry.

CHM 3586 Thermodynamics 1
Covers First Law of Thermodynamics, Thermochemistry, Second and Third Laws, free energies, and reaction and phase equilibria. *Prereq.* Permission of instructor.

CHM 3596 Foundations of Spectroscopy
This course deals with the fundamentals of quantum mechanics, with applications to spectroscopy of atoms, molecules, and proteins. Topics include: Introduction to quantum mechanics; Mathematical tools; Rigid rotor; Microwave spectroscopy; Harmonic oscillator; Infrared and Raman spectroscopy; Hydrogen atom; Emission spectra; Electron spin; applications to molecular and biological systems.

CHM 3599 Chemical Kinetics
Explores the use of experimental data to deduce the rate law of a reaction. Covers mechanisms deduced from rate laws, and the influence of experimental error on precision of rate constants and activation energies. Examines collision-and transition-state theories of reaction rates. *Prereq.* One year of physical chemistry.

III. Advanced Courses

CHM 3600, 3601, 3602 Special Topics in Analytical Chemistry 1, 2, 3 3 QH each
Presents selected topics of current importance in analytical chemistry. *Prereq.* Permission of instructor.

CHM 3605, 3606, 3607 Special Topics in Inorganic and Materials Chemistry 1, 2, 3 3 QH each
Presents selected topics of current importance in inorganic and materials chemistry. *Prereq.* Permission of instructor.

CHM 3610, 3611, 3612 Special Topics in Organic Chemistry 1, 2, 3 3 QH each
Presents selected topics of current importance in organic chemistry. *Prereq.* CHM 3666 and permission of instructor.

CHM 3616, 3617 Analytical Biotechnology 1 and 2 3 QH each
For graduate students in chemistry without undergraduate training in biochemistry. Gives overview of the bioanalytical methods used to characterize DNA and proteins followed by application of instrumental methods of analysis to DNA analysis and protein characterization. *Prereq.* CHM 3511, 3512, and 3513.

CHM 3619 Environmental Analytical Chemistry
Describes the application of instrumental methods for analyzing environmental samples for major, minor, and trace components of toxicological concern. Topics include: Sampling strategies for natural systems, determination of trace metals in natural waters and biologicals, determination of xenobiotics by GC, LC, GC-MS and LC-MS, remote sensing of atmospheric pollutants, molecular biomarkers and detection of protein and DNA adducts. *Prereq.* CHM 3511, 3512, and 3513.

CHM 3620, 3621, 3622 Special Topics in Physical Chemistry 1, 2, 3 3 QH each
Studies advanced topics of importance in physical chemistry including quantum chemistry. *Prereq.* Permission of instructor.

CHM 3647 Characterization of Advanced Materials
Examines the analytical capabilities of techniques used to determine the composition and chemical properties of materials in the solid state. Topics include: Thermal methods of analysis: DTA and DSC, x-ray photoelectron spectroscopy and ESCA, electron imaging: SEM and TEM, x-ray diffraction, x-ray fluorescence, atomic-scale imaging: scanning tunneling and atomic force microscopies, conductivity and super conductivity, voltammetric and potentiometric determination of redox properties. *Prereq.* CHM 3547.

CHM 3666 Organic Synthesis 2
Surveys types of organic reactions, including stereochemistry, influence of structure and medium, mechanistic aspects, and synthetic applications. *Prereq.* One year of organic chemistry, CHM 3566.

CHM 3667 Mechanistic and Physical Organic Chemistry 2
Introduces the theory and practice of organic synthesis, including mechanistic aspects as they

influence synthetic design and practice. *Prereq.* CHM 3567.

CHM 3669 Advanced NMR Spectroscopy
Presents descriptive theory of nuclear magnetic resonance experiments and applications of advanced techniques to structure determination. Includes relaxation, nuclear Overhauser effect, polarization transfer, and correlation in various one- and two-dimensional experiments. *Prereq.* CHM 3569.

CHM 3676 Bioorganic Chemistry
Topics include: host guest complexation by crown ethers, cryptands, podands, spherands, etc.; molecular recognition, including self-replication; peptide and protein structure; coenzymes and metals in bioorganic chemistry; nucleic acid structure; interaction of DNA with proteins and small molecules, including DNA-targeted drug design; catalytic RNA; catalytic antibodies. *Prereq.* CHM 3566 and CHM 3567.

CHM 3680 Advanced Topics in Organic Synthesis
Detailed study of current topics in the synthesis of various classes of natural products including alkaloids, steroids, terpenoids, and various antibiotics.

CHM 3686 Thermodynamics 2
Introduces the Boltzmann distribution, partition functions and their application to thermodynamics, and phase space. Applies statistical thermodynamics to selected physical systems. *Prereq.* CHM 3586.

CHM 3696 Fundamentals of Molecular Structure and Electronics
Continuation of CHM 3596, Many-electron atoms, Simple diatomic molecules. Conjugated pi-electron systems. The electronic structure of molecules. Molecular modelling. Modelling of proteins and biological systems. *Prereq.* CHM 3596.

CHM 3698 Principles of Magnetic Resonance
The physical principles underlying magnetic resonance spectroscopy are presented, including Fourier transform theory, classical and quantum-mechanical treatments of spin angular momentum, the Bloch equations, spin relaxation, and density matrix formalism applied to chemical and molecular dynamics. Different magnetic resonance methods will be introduced, with emphasis on time-domain NMR methods such as phase cycling, 2D

spectroscopy, and selective pulse sequences. A special topic may be included from among the following: (i) magnetic resonance imaging (MRI), (ii) solid-state NMR (CP-MAS), or (iii) macromolecular structure determination by 3D and 4D NMR. *Prereq.* CHM 3596.

CHM 3798 Master's Continuation 0 QH

CHM 3800 Analytical Seminar 1 QH
Focuses on oral reports by the participants on current investigations in analytical chemistry. *Prereq.* Enrollment in full-time program.

CHM 3801 Inorganic Seminar 1 QH
Focuses on oral reports by the participants on current investigations in inorganic chemistry. *Prereq.* Enrollment in full-time program.

CHM 3802 Organic Seminar 1 QH
Presents oral reports by the participants on current investigations in organic chemistry. *Prereq.* Enrollment in full-time program.

CHM 3803 Physical Chemistry Seminar 1 QH
Considers oral reports by the participants on current investigations in physical chemistry. *Prereq.* Enrollment in full-time program.

CHM 3805 Directed Laboratory Research 4 QH
Involves faculty-guided studies that are not directly related to research pursued for thesis or dissertation. *Prereq.* Permission of instructor. *Non-thesis students.*

CHM 3806 Directed Literature Research 4 QH
Focuses on extensive research of the primary literature under direction of a graduate faculty member, leading to a comprehensive written review of a significant chemical problem and an oral examination. *Prereq.* Permission of instructor. *Non-thesis students.*

CHM 3811 (1 QH), CHM 3812 (2 QH), CHM 3813 (3 QH), CHM 3814 (4 QH), CHM 3815 (5 QH), CHM 3816 (6 QH)
Master's Research
Offers the chance to conduct original research, written thesis thereon or to the establishment of doctoral candidacy. *Prereq.* Enrollment in full-time program.

**CHM 3820 Doctoral Research and
Dissertation**

0 QH

Offers the opportunity to complete original research in depth, representing a significant contribution of new chemical knowledge, and a written dissertation

thereon, under the supervision of a faculty member.
Prereq. Doctoral candidacy.

Economics

All courses carry three quarter-hours of credit unless otherwise specified.

**ECN 3010 Introduction to Microeconomic
Theory**

0 QH

Covers basic microeconomic theory, including consumption, production and cost theory, market structure, and welfare economics. Designed for MA degree students who need to improve their background in micro theory. Carries no academic credit toward the MA program.

**ECN 3020 Introduction to Macroeconomic
Theory**

0 QH

Covers basic macroeconomic theory, emphasizing analytical concepts and tools, with some application to macroeconomic problems and public policy. Designed for MA degree students who need to improve their background in macro theory. Carries no academic credit toward the MA program.

**ECN 3110 Introduction to Microeconomic
Theory for Master of Science Students**

4 QH

Covers basic microeconomic theory, including consumption, production and cost theory, market structure and welfare economics. This course is equivalent to ECN 3010.

**ECN 3120 Introduction to Macroeconomic
Theory for Master of Science Students**

4 QH

Covers basic macroeconomic theory with an emphasis on analytical concepts and tools with some application to macroeconomic problems and public policy. This course is equivalent to ECN 3020.

ECN 3131 Mathematics for Economists I

4 QH

This course acquaints the student with the matrix algebra and elementary calculus necessary for quantitative economics: simultaneous linear systems; polynomial, logarithmic and exponential functions; and elementary differential and integral calculus.

ECN 3140 Statistical Methods

4 QH

Descriptive statistics, basic probability, probability distributions, inference, correlation, and regression.

**ECN 3150 Microeconomic Policy and Planning
Seminar**

4 QH

Explores cost efficiency and effectiveness, assessment of externalities, shadow prices, benefit-cost analysis, project implementation and evaluation. Discusses budget analysis, evaluation of public programs, role of private and public sectors, relationship of projects to macro planning, and the use of analysis by policymakers. *Prereq. ECN 3110, ECN 3140 co-requisite.*

**ECN 3151 Macroeconomic Policy and Planning
Seminar**

4 QH

Examines the role of public sector in the economy. Investigates socio-economic objectives and public policies, and national economic planning and synthesis of models for growth and development. Presents the tools and techniques for economic planning, and reviews the construction and utilization of input-output tables. Describes planning and policy implementation and evaluation. *Prereq. ECN 3120, ECN 3140 co-requisite.*

**ECN 3153 Workshop in Economic Planning and
Policy**

4 QH

Empirical work involving micro and macro planning techniques, applying the latter to individual case studies of a specific plan, program, or organization. Students are expected to prepare and present a research paper on a chosen case study, demonstrating the ability to use planning techniques. *Prereq. ECN 3150 and ECN 3151.*

ECN 3210 Microeconomic Theory I

4 QH

Presents microeconomic theory at the MA level. Investigates equilibrium conditions in consumption and production and the theory of factor markets and efficiency. Various types of market structures are

covered with respect to these areas. *Prereq. ECN 3131.*

ECN 3220 Macroeconomic Theory I 4 QH

Theories of the determination of output, income, employment, prices and related macroeconomic variables. Alternative macroeconomic models will be presented. This M.A. level course requires students to have an adequate preparation in intermediate macroeconomic and microeconomic theory as well as mathematics. *Prereq. ECN 3131.*

ECN 3231 History of Economic Thought 4QH

An inquiry into the development of economic thought, focusing on the analytical innovations in economic thought, beginning with the physiocrats and extending up to contemporary thinkers. Stresses the persistence of certain topics, like money, capital accumulation, macroeconomic stability and value theory, throughout the development of economic thought and considers the historical policy issues that inspired different thinkers to address these topics in a new way.

ECN 3240 Statistical Inference 4 QH

A study of statistical methods and techniques. Probability theory and models, testing economic hypotheses, analysis of variance, estimation, non-parametric tests, and t-statistics and F-statistics. Correlation analysis.

ECN 3241 Econometrics I 4 QH

Covers the basic linear model; estimation, inference, prediction, model selection and misspecification, qualitative variables, multicollinearity, heteroscedasticity, autocorrelation, dynamic models, and instrumental variables. *Prereq. ECN 3240 or permission of instructor.*

ECN 3252 M.A. Workshop 4 QH

Selected topics for M.A. students, with a major writing assignment. *Prereq.: Completion of two courses in a chosen field.*

ECN 3315 Economics of Law and Public Policy

Builds on a knowledge of intermediate microeconomic theory in evaluating the justification for an impact of various bodies of law and public policy. While the particular examples and focuses may vary, the emphasis of the course will be on economic justifications for government intervention; public policy alternatives; and impact evaluation of alternative government policies. Discussions will rely on economic models of behavior and social welfare theory to describe and

predict the impact of law/regulation/policy and to evaluate alternative forms of intervention. Topics include the elements of an economic perspective, unregulated market behavior, market failure and public intervention, policy and program evaluation, and the economics of contract and tort law. Limited to Law, Policy, and Society students, with exceptions by permission of the instructor. *Prereq. 3110 or permission of instructor.*

ECN 3350 Labor Economics I

Presents labor force measurement and determinants, changes in Labor force participation and composition, and microanalysis of labor supply and demand. Topics also include varieties of labor markets and their functioning, labor allocation and migration, minimum wages, and applications of human capital theory to the labor force. *Prereq. ECN 3110.*

ECN 3351 Labor Economics II

Money-wage and employment determination in the short run, the Phillips curve, and macro wage-price problems. Discusses income policies, unemployment and underemployment, technological change, and changing skill requirements. Includes productivity measures, determinants and trends, and secular changes in real wages and employment. *Prereq. ECN 3120.*

ECN 3359 Seminar in Labor Economics

Selected topics in Labor Economics. *Prereq. Permission of instructor.*

ECN 3360 Regional Economic Theory

Location Theory (Losch, Polander, Ohlin, Isard): export base theory, transport inputs; location equilibrium of firms; market size; agglomeration location externalities; land use in agriculture and urban areas; residential mobility and household location modelling; public facility location (multi-regional and multi-authority decision context); interregional trade. *Prereq. ECN 3110.*

ECN 3362 Economics of Crime

Discusses the resource allocation problem as it relates to criminal behavior and effective law enforcement. Evaluates costs and benefits of alternative law enforcement policies. Analyzes criminal activity, including organized crime in an economic context.

ECN 3363 Urban Economic Theory

This course examines the theory, evidence and policy concerning urban areas. The topics covered

in this course will include size and distribution of cities, location theory and development trends, an analysis of the housing market in the U.S., and an examination of zoning and growth controls, and a look at the role of local government in urban problems. The focus will be on U.S. cities, although an examination of cities in developing countries will be included. *Prereq. ECN 3110.*

ECN 3364 Urban Economic Development

Investigates problems in urban economic development. Topics include: dynamic and structural change in urban economies, models and techniques for describing and evaluating urban economies, development strategies and tools, commercial and industrial development, and housing development. *Prereq. ECN 3110.*

ECN 3366 Economics of Transportation

Provides an application of microeconomic theory to transportation. Topics include: demand and demand estimation, cost and cost estimation, pricing and investment, and regulation and deregulation. Applications cover both urban and intercity passenger transportation as well as freight transportation. *Prereq. ECN 3110 and or ECN 3131.*

ECN 3367 Environmental Economics

Uses the tools of conventional economics to address the relationships between ecosystems, economic systems, and sustainability. The course also examines the role of economic analysis in the design and implementation of current environmental policy. The theory of efficiency and welfare and their applications to regulation and project evaluation are discussed. Additional topics to be addressed in the course will include environmental benefit-cost analysis and the allocation over time of exhaustible and renewable natural resources. *Prereq. ECN 3110.*

ECN 3369 Seminar in Regional Economic Issues

Selected Topics in Regional Economic Issues.

Prereq. Completed Masters-level field requirements.

ECN 3370 Economic Development Theory

Alternative approaches to the analysis of economic development. Topics include: theories of underdevelopment and development; quality of life, income distribution and development; empirical studies of patterns, sources and determinants of growth; structural change; industrialization; agricultural development; trade policies and liberalization; political economy of

development politics. *Prereq. ECN 3110 and ECN 3120.*

ECN 3371 Regional Development

Subnational applications of spatial theory; brief review of theory; regional dualism, growth and development; export-base and shift-share analysis; interregional resource flows; migration, capital, and commodity flows; concept and application of growth-pole schemes; regional policies within a national context; regional planning; input-output techniques for regional forecasting and planning; business location decisions; centralization vs. decentralization policy approaches. *Prereq. ECN 3110.*

ECN 3373 Development Finance

Examines sources of investment finance in developing countries two gap models; role of taxation and tax structure reform; development of financial institutions and capital markets; private and official finance from abroad and debt-servicing problems; and problems of monetary management and export instability. *Prereq. ECN 3120.*

ECN 3376 Policy Analysis In LDCs

Survey and application of models and techniques to analyze policies and plans in developing countries. Techniques include: cost-benefit analysis, input-output models; linear programming, social accounting matrices, macro-econometric models, and computable general equilibrium models. Emphasis on developing a working understanding of methods, and on exposure to a range of applications. *Prereq. ECN 3110 and ECN 3120.*

ECN 3379 Seminar in Development Economics

Selected topics in development economics.

Prereq. ECN 3370 and ECN 3373.

ECN 3380 Monetary Theory

Studies the relationships between money and economic activity emphasizing various quantity theory models and theories of the demand for money and velocity. *Prereq. ECN 3120.*

ECN 3381 Monetary Policy

Analyzes monetary policy in the United States. Studies Federal Reserve objectives, policy instruments and techniques and their relationship to aggregate economic activity and financial markets. Introduces recent developments and issues.

ECN 3383 Intergovernmental Fiscal Relations

A study of the development of the federal system, interstate and interarea fiscal comparisons, grants-in aid, tax credits, revenue sharing, state and local taxes, nontax revenues, borrowing and budgeting at the state and local level, and a discussion of the process and prospects of state and municipal equalization of tax burden and efforts. *Prereq.* ECN 3120.

ECN 3389 Seminar in Money and Finance

Selected topics in money, credit and banking. Students will write research papers. *Prereq.* *Permission of instructor.*

ECN 3390 Public Economics I: Expenditure

Theory of public goods and externalities; role and scope of the public sector; selected topics in public choice; public enterprise pricing and output; fiscal federalism and intergovernmental relations. *Prereq.* ECN 3110 and ECN 3131 or *permission of instructor.*

ECN 3391 Public Economics II: Taxation

Theoretical and institutional analysis of tax policy and governmental finance; effects of tax policy on the behavior of individuals and corporations. *Prereq.* ECN 3110 and ECN 3131, or *permission of instructor.*

ECN 3392 Public Policy and Finance

A master's level survey of policy issues in public economics. Discusses public goods and cost-benefit analysis. Additional topics are at the discretion of the instructor, but may include budget deficits and the public debt, environmental policy, health care financing, education financing, social insurance programs, and incentive and welfare effects of taxation. *Prereq.* ECN 3120.

ECN 3399 Seminar in Public Economics

Selected topics in public economics. Workshop paper required. *Prereq.* ECN 3390 and ECN 3391.

ECN 3400 International Finance

Studies international finance, international monetary agreements, and open-economy macroeconomics. Topics include foreign exchange markets, balance of payments, theory of efficient markets, exchange rate determination theories, efficiency off foreign exchange markets, news, noise traders and volatility of exchange rates, international capital movements, the international and European monetary systems, and the European Monetary Union. *Prereq.* ECN 3120.

ECN 3401 International Trade

Explores models of trade, international comparative advantage, Heckscher-Ohlin theory, protectionism and tariffs, customs union theory, trade and economic growth, uncertainty in trade models, natural resources, increasing returns, monopolistic competition, industrial organization, and trade policies. *Prereq.* ECN 3110.

ECN 3405 Seminar in International Economics

(Ph.D.) Selected topics in international economics. *Prereq.* ECN 3400 and ECN 3401.

ECN 3541 Time Series Analysis**4 QH**

Topics include Box-Jenkins model, VAR and Bayesian VAR, testing for unit roots, causality, cointegration, exogeneity, an introduction to statistical decision analysis, systems of simultaneous equations, Kalman filter and state-space modeling, methodologies of econometrics, simulation and other computer intensive methods, spectral analysis , and forecasting. *Prereq.* ECN 3241.

ECN 3542 Cross Section Analysis**4 QH**

Topics include logit, probit, models with censored or truncated variables, panel data models, duration models, and non-linear estimation. *Prereq.* 3241.

ECN 3545 Seminar in Applied Econometrics

Selected topics in econometrics. *Prereq.* ECN 3541, ECN 3542 or *consent of instructor.*

ECN 3798 Master's Continuation**0 QH****ECN 3850-3852 Internship in Economics 1-3 QH**

Comprises academic credit for internship work in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3860-3862 Internship in Economics 1-3 QH

Comprises academic credit for internship work in economics. For PhD students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3870 Readings in Economics**1 QH**

Offers supervised reading in selected topics in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3871 Readings in Economics 2 QH
Offers supervised reading in selected topics in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3872 Readings in Economics 3 QH
Offers supervised reading in selected topics in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3873 Readings in Economics 4 QH
Offers supervised reading in selected topics in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3874 Readings in Economics 5 QH
Offers supervised reading in selected topics in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3875 Readings in Economics 6 QH
Offers supervised reading in selected topics in economics. For MA or MS students only. *Prereq.* *Permission of instructor and approval of graduate coordinator.*

ECN 3890 Master's Thesis 6 QH
Provides thesis supervision by members of the department. *Prereq.* *Approval of graduate coordinator.*

Education

All courses carry three quarter-hours of credit unless otherwise specified.

ED 3300 Theories of Learning and Instruction
Compares basic principles of learning, acquisition, retention, and transfer. Considers the applications of these principles in such areas as child rearing and schooling. Cognitive and behavioral models of learning will be considered. *Suggested Prereq.* *A course in psychology.*

ED 3302 Psychology of Personality
Considers the personality theories of Freud, Jung, Adler, Sullivan, Horney, Cattell, Allport, Rogers, and other approaches, including the psychosomatic of Alexander and the work of Reich. Examines theories in depth for ways that contribute to an understanding of dynamic factors in personality formation. Compares theories and theorists for a greater understanding of strengths and weaknesses. Discusses social, cultural and philosophic questions. Considers implications of some of the ideas and theories for the therapeutic process. *Suggested prereq.* *At least one course, and preferably more, in psychology.*

ED 3303 Theories of Developmental Psychology
Reviews representative developmental theories. Compares and analyzes key aspects of these theories with a focus on educational implications. *Prereq.* *Permission of instructor.*

ED 3304 Child Psychology
Surveys principles of child development from the prenatal period through preadolescence. Reviews physical, cognitive, language, social, and personality development in the context of relevant theory. Considers educational implications.

ED 3305 Adolescent Psychology
Examines social, emotional, and intellectual development in the adolescent years. Studies problems in family relationships and in adolescents' social environment as well as their adjustment in school.

ED 3307 Adult Psychology
Explores the three major areas of adulthood (young adulthood, middle age, and old age) in a context of research findings, academic knowledge, and clinical findings.

ED 3308 Seminar in Child Development
Presents a seminar course with emphasis on discussion of critical issues in child development. Allows for students to select topics, review and evaluate research, examine the relevance of the research to educational theory and practice, and present their findings and conclusions to the

seminar. *Prereq.* A course in child psychology or human development.

ED 3309 Seminar in Adolescent Development

This course will focus on middle and high school-age students. Problems and issues that are of particular importance during this developmental stage are examined in depth using a case study approach. Regular analysis and critique of cases that highlight specific social, cultural, and psychological concerns will be carried out. Each student will prepare a case study based on his/her personal experiences in a field placement. *Prereq.* A course in adolescent psychology or human development.

ED 3313 Human Development: Understanding the Child and Adolescent

A systematic survey of human development for students in school psychology and for other qualified graduate students. Particular attention will be given to developmental principles and changes in critical domains (e.g. Perception, cognition, language, emotions) during childhood and adolescence.

ED 3320 The School in a Culturally Diverse Society

This course will focus on schools and classrooms as sociocultural systems. Explores how shared and divergent norms, values, beliefs, and patterns of social interaction affect learning, development, and behavior of staff as well as students. Case studies examine strategies through which teachers can identify crucial aspects of the culture of schools and classrooms and respond appropriately to them. It is expected that exposure to a variety of resources will lead participants to become more sensitive to their roles in improving the quality of educational experiences within a multicultural society.

ED 3340 Introduction to Educational Statistics

Studies basic descriptive statistics for measurement and research. Topics include use of statistical notation, measures of central tendency and variability, probability and sampling techniques, theoretical distributions, linear regression and correlation, and an introduction to statistical inference. This course, or completion of a statistics proficiency examination, is required for admission to ED 3342.

ED 3341 Intermediate Educational Statistics

Explores statistical inference of normal populations and discrete data; estimation; testing of hypotheses;

multiple correlation, analysis of variance and covariance; contingency; the chi-square test and other nonparametric tests. Emphasizes application in educational research. This course must be completed prior to doctoral candidacy. *Prereq.* Successful completion of the statistics proficiency examination; satisfactory completion of ED 3340 or permission of instructor.

ED 3342 Research Design in Education

Introduces scientific inquiry methods which may be used to design research projects and to create effective learning environments. The student will be shown how to design, evaluate, critique and interpret research outcomes and methodologies, and how to apply these research methods to evaluate alternative instructional practices. The student will be shown how to read and evaluate professional literature and how to use the results of published literature to improve classroom instructional activities. *Prereq.* ED 3340, an equivalent statistics course, or passing a statistics proficiency examination administered by the Education Department.

ED 3343 Advanced Research Design

Focuses on methodologies for collecting, interpreting, and evaluating data and deals with biases encountered in the data-collection process. Topics include data collection and interpretation, use of sampling, analysis of variance, covariance, multiple regression, multivariate procedures, and advanced topics in scaling, semantic differential methodology, questionnaire design, interview methodology, and evaluative criteria. Requires students enrolling for this course to design and complete a proposal on this design for the conduct of a research project, which may be carried out as part of a research on either the master's or doctoral level. *Prereq.* ED 3341, equiv., or permission of instructor.

ED 3346, ED 3347 Independent Research Seminars 1, 2

3 QH each

Focuses on the design, conduct, analysis, and reporting of data from an individual research project. May be original or secondary, applied, theoretical, or action research and must be substantially larger in scope than that accommodated by directed study. Involves evaluation that will be based on oral and written interim reports in ED 3346 and oral and written final reports in ED 3347. Will serve as an option to the thesis requirement only for students enrolled in

the master's degree program in educational research.

ED 3349 Computer Applications of Multivariate Statistics

Explores concepts, applications, and interpretation of data analyses using the VAX computer and BMDP software package. Provides data to students and asks them to perform and interpret data analyses using statistical procedures including: multivariate analysis of variance and covariance, multiple regression, linear and multiple discriminant analysis, factor analysis and rotational techniques, and canonical correlation. *Prereq. ED 3341.*

ED 3400 The Instructional Process

Considers the rational basis for effective teaching and the nature of the educational process. Relates learning theory to the various strategies and activities that can be implemented within a learning situation to meet the needs of the learners, including those with special needs. Employs alternative approaches, research results, and theoretical constructs to help extend the prospective teacher's understanding of the educational process and the role of the teacher in it. Requires fifteen hours of fieldwork. Open to students in teacher certification program.

ED 3401 Fundamentals of Curriculum Development

Examines how goals and objectives are selected and how priorities are determined. Considers methods of designing educational programs to meet specified goals and methods of evaluating educational outcomes in terms of the goals of the program and techniques for modifying programs in the light of such performance.

ED 3402 Methods and Materials for Teaching Children in Social Studies

Examines teaching methods and learning materials used in teaching children in a number of educational settings. Helps students establish objectives, plan and execute appropriate learning experiences, and effective outcomes. Focuses on social studies. Requires fifteen hours of fieldwork. Open to students in teacher certification program.

ED 3403 Methods and Materials for Teaching Children in Science and Math

Provides a continuation of ED 3402. Focuses on physical and natural science, mathematics, health and nutrition. Requires fifteen hours of fieldwork.

Open to students in teacher certification program. *Prereq. ED 3402*

ED 3404 Methods and Materials for Teaching Adolescents and Adults 1

Considers specific methods and materials appropriate to teaching adolescents and adults. Develops in the students an understanding of the teaching and learning process, encourages attitudes conducive to and identified with good tenets of teaching, and fosters acceptance of the need to grow constantly and to be aware of the continuing development of our knowledge of the learning-teaching process. Requires fifteen hours of fieldwork. Open to students in secondary teacher certification program.

ED 3405 Methods and Materials for Teaching Adolescents and Adults 2

Provides for the specific subject areas to be attended to. Topics include organizing and presenting lessons, developing teaching materials, using audiovisual equipment, developing and implementing evaluation instruments, and selecting appropriate materials within each field of interest. Requires fifteen hours of fieldwork. Open to students in secondary teacher certification program. *Prereq. ED 3404.*

ED 3406 Procedures of Evaluation

The use of formative and summative evaluation techniques for assessing pupil performance, and procedures for the evaluation of teacher performance. Will include informal and formal evaluation procedures, samples of student performance including portfolios containing specimens reflecting varied modes of expression, teacher-made tests, criterion and norm-referenced tests. Issues involved include reliability and validity, speededness, and test-appropriateness for different populations. *Prereq. A course in statistics.*

ED 3407 Practicum in Student Teaching and Seminar

6 QH

Offers a University-arranged practicum of observation and teaching in schools offering comprehensive programs within twenty miles of the University. Participating on a full-time basis for 150 to 300 hours requires the student to develop planning and communication skills within the major field. Includes biweekly seminars at the University to analyze theory-practice relationships and to examine generic problems of teaching. Open only to students in the provisional teacher

certification program. *Prereq. completion of all coursework and fieldwork requirements in the provisional certification program.*

ED 3409 Seminar in Curriculum

Identifies and analyzes problems in curriculum and instruction in light of the forces affecting the curriculum within the student's area of specialization; design and implementation of solutions to such problems; evaluation and field testing, where feasible. *Prereq. ED 3401 or equiv. and Teaching Experience, or permission of the instructor.*

ED 3414 Seminar in Reading Consulting

Examines the role of the consulting teacher of reading in designing, implementing, and evaluating reading programs. Includes organizational plans, staff supervision and development, inservice education, working with parents, and accommodating special needs students. Objective is to provide consulting skills needed to communicate effectively with the wider school community. Examines staff utilization through team teaching and other models.

ED 3417 Clinical Internship in Teaching and Seminar

6 QH

A University-arranged teaching internship of at least 400 hours of full-time teaching. Includes biweekly seminars at the University to analyze theory-practice relationships and to examine generic problems of teaching. Open only to students in the full certification program. Students currently teaching full time may use this position in lieu of the internship placement. *Prereq. provisional certification; student teaching practicum; matriculation in a full certification program.*

ED 3420 The English-Language Arts Curriculum

Considers the design and function of the English-language arts curriculum; selected current issues as they impinge upon the English language arts curriculum; the design and function of research in the English-language arts curriculum. Open to certified or experienced teachers. *Prereq. Teaching experience or certification.*

ECN 3427 Literature and Materials Seminar

Examines literature for children, adolescents, and adults; the sources of interest in literature as they relate to the reader; the interrelatedness of

literature and other components of language arts program; investigation of materials available. Allows students to develop projects related to their needs and interests.

ED 3430 History and the Social Studies In The School Curriculum

Permits the student to explore some of the fundamental concepts of anthropology, sociology, economics, political science, and history. Emphasizes the interrelatedness of disciplines and the extraction of operating principles that aid in the analyses of social problems. Equips students to find a greater variety of conceptual relationships within the historical social science field, and from there a framework for evolving courses of study may be generated. *Prereq. Teaching experience or certification.*

ED 3440 Science in the School Curriculum

Considers the Massachusetts Curriculum Frameworks for Science and Technology as it affects the content and the pedagogical methodology for the teaching of science. A course for teachers with specialized science teaching responsibility, who seek standard certification or recertification, covers all levels of science curriculum content from K - 12, emphasizing interdisciplinary science offerings. Students will create and critique learning experiences consistent with such Frameworks' precepts as providing authentic tasks of inquiry, reasoning, and problem solving; using hands-on experiences; working in groups. *Prereq. science minor; provisional with advanced standing teacher certification.*

ED 3442 Seminar in Mathematics Education

Requires students to analyze a mathematics learning problem, to investigate relevant research, and to prepare materials embodying their own proposed solutions. *Prereq. Teaching experience or certification.*

ED 3450 Foundations of Literacy

This course will emphasize literacy development in the elementary grades. It will consider reading and writing as ways of exploring and reacting to the world in a thoughtful, articulate manner. The traditional bases for reading instruction will be examined and compared with current language development theory, and the instructional implications of both will be considered. An integrated language learning perspective drawn from recent research on language and literacy acquisition will serve as the basis for instructional

methodology. It is expected that students will build an understanding of children's language, reading, and writing development that will enable them to make appropriate instructional decisions in the classroom.

ED 3451 Language and Reading

This course focuses on child language and learning. It will consider the nature of human language, language structure, and how the speaker/listener "makes meaning" in language, both spoken and written. The behaviors and strategies children use as they acquire language will be examined. Attention will be given to language variation, second language learning, and "classroom talk". Students will learn to listen to children purposefully and use this information to assess, monitor, and guide children's learning. Students will derive an instructional model and identify teaching behaviors that promote language and literacy. *Prereq.* ED 3450.

ED 3453 Diagnosis and Remediation of Reading and Language Disabilities

Explores reading and language disabilities; causes and correlates of disability; language differences; aspects of measurement; diagnostic and corrective procedures in reading, writing, and related language skills; selected research findings bearing on relevant topics. *Prereq.* ED 3450.

ED 3456 Clinical Experience in Reading

The student works as a reading teacher and consultant during a 400-hour (half-year) commitment at a field site. The student implements diagnostic and remedial programs with children, and consults with teachers and carries out staff development programs to promote effective developmental and content area reading instruction. Supervision is provided by reading faculty who meet individually with students and in group bi-weekly seminars. *Prereq.* completion of required courses in the teacher of reading program, including the practicum.

ED 3458 Practicum in Reading

A seventy-five hour field practicum that offers students the opportunity to apply consulting and remediation skills in a school setting. Allows students to consult with teachers on the implementation of developmental and corrective reading and on reading in the content areas and also to provide diagnostic and remediation to pupils having special needs in reading. *Prereq.* ED 3453.

ED 3462 Seminar: Ethnicity and Today's School Curriculum

Reviews aspects of the history and culture of some ethnic groups to explore the manner in which certain universal needs are manifested. Evaluates prepared curricular experiences and authentic literary, visual, and artifact materials, and relates to developed criteria, goals, and potential educational impact. Requires students asked to select, organize, and, as necessary, develop materials and strategies appropriate for classroom use.

ED 3484 Instructional Innovation and Technology

Traditionally, literacy has been defined as the ability to read and write. Print, as one of several technologies of communication, has been equated with education. Video technology and computers give rise to a new, visual literacy: constructing mental maps from visual cues. This course explores how this new technology, especially computer technology, changes the way learners process information. The course also considers the new medium's strengths and weaknesses, and focuses on what strategies schools do and should pursue to foster visual literacy skills. Hand-on experience with computers and educational software is included.

ED 3555 Introduction to Computer Use for Professionals

Includes introduction to computer capabilities and limitations; selection of hardware/software; use of a line editor; introduction to system command language; and introduction to data processing through a packaged library program such as SPSS, BDMP, MINITAB, or IMSL.

ED 3798 Master's Continuation

0 QH

ED 3800 Directed Study

3 QH

Provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the department. Not available to special students. *Prereq.* Approval of the chair of the department. Approval form must be submitted during the quarter prior to registration for the directed study.

ED 3801 Thesis

8 QH

Offers a research activity that may be selected by the student in lieu of two courses (8 QH), with the approval and recommendation of the advisor.

ED 3805 Directed Study 1 QH

Provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the department. Not available to special students. *Prereq.* *Approval of the chair of the department.* *Approval form must be submitted during the quarter prior to registration for the directed study.*

ED 3820 Workshop in Education 1 1 QH

A workshop in a specific field of interest may be offered from time to time. Emphasis is on developing instructional materials or resolving a practical problem in a school or institutional setting. A workshop may be held for participants who are employed in a common field of work. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. One quarter hour for a workshop of 7-10 contact hours.

ED 3821 Workshop in Education 2 2 QH

A workshop in a specific field of interest may be offered from time to time. Emphasis is on developing instructional materials or resolving a practical problem in a school or institutional setting. A workshop may be held for participants who are employed in a common field of work. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. Two quarter hours for a workshop of 15 contact hours.

ED 3822 Workshop in Education 3 3 QH

A workshop in a specific field of interest may be offered from time to time. Emphasis is on developing instructional materials or resolving a practical problem in a school or institutional setting. A workshop may be held for participants who are employed in a common field of work. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. Three quarter hours for a workshop of 30 contact hours.

ED 3823 Workshop in Education 4 4 QH

A workshop in a specific field of interest may be offered from time to time. Emphasis is on developing instructional materials or resolving a practical problem in a school or institutional setting. A workshop may be held for participants who are employed in a common field of work. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. Four quarter hours for a workshop of 45 contact hours.

ED 3825 Institute in Education 1 1 QH

An institute in a specific field of interest may be offered from time to time. The institute may be collaborative and interdisciplinary, drawing on several departments of the university and resources outside. It involves total time commitment on the part of the participants for the duration of the institute. Institutes are customarily designed for participants who are currently employed in a common field or work and wish to receive additional preparation in new methods, new materials, and new content areas. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. One quarter hour for thirty contact hours.

ED 3826 Institute in Education 2 2 QH

An institute in a specific field of interest may be offered from time to time. The institute may be collaborative and interdisciplinary, drawing on several departments of the university and resources outside. It involves total time commitment on the part of the participants for the duration of the institute. Institutes are customarily designed for participants who are currently employed in a common field or work and wish to receive additional preparation in new methods, new materials, and new content areas. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. Two quarter hours for sixty contact hours.

ED 3827 Institute in Education 3**3 QH**

An institute in a specific field of interest may be offered from time to time. The institute may be collaborative and interdisciplinary, drawing on several departments of the university and resources outside. It involves total time commitment on the part of the participants for the duration of the institute. Institutes are customarily designed for participants who are currently employed in a common field or work and wish to receive additional preparation in new methods, new materials, and new content areas. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. Three quarter hours for ninety contact hours.

ED 3828 Institute in Education 4**4 QH**

An institute in a specific field of interest may be offered from time to time. The institute may be collaborative and interdisciplinary, drawing on several departments of the university and resources outside. It involves total time commitment on the part of the participants for the duration of the institute. Institutes are customarily designed for participants who are currently employed in a common field or work and wish to receive additional preparation in new methods, new materials, and new content areas. Graduate credit that is granted may not be applied toward a degree program without the approval of the department offering the major field of specialization degree work. Participants must be degree candidates or must qualify, prior to registration, as special graduate students. Four quarter hours for one hundred twenty contact hours.

English

Students in graduate programs other than English and Curriculum and Instruction may register for English department courses only in the first week of classes and only with the permission of the instructor.

All courses carry three quarter-hours of credit unless otherwise specified.

ENG 3300 Introduction to Critical Issues

Presents approaches to the study of literature considering both traditional and contemporary views.

American Literature

ENG 3324 Perspectives on American Literature

Attempts to discover or disrupt common themes and recurrent patterns in American literature through a close reading of critics or a critique of primary texts.

ENG 3325 Topics in Early American Literature

Focuses on the work of one writer, a group of writers, or a theme or structure common to several writers—Jonathan Edwards, women writers, the poets of the seventeenth and eighteenth centuries, or typology, for example—in the first two hundred years of American literature. Topics change with time and demand.

ENG 3326 Topics in Twentieth-Century American Literature

Examines an issue or issues in twentieth-century American literature: for instance, women in twentieth-century American writing; surrealism in modern and contemporary American poetry; naturalism and the city in the modern American novel; autobiography by American women writers of color; race, ethnicity, and the oral tradition in ethnic American literature.

ENG 3327 Major American Novelist

Examines in detail the work of a major American novelist and its historical context and cultural milieu—the work, for example, of Herman Melville, Mark Twain, Henry James, Willa Cather, Ernest Hemingway, Edith Wharton, Richard Wright, or Toni Morrison.

ENG 3328 Major American Playwright

Examines in detail the work of a major American playwright and its theatrical style and social

impact—the work, for example, of Eugene O'Neill, Tennessee Williams, Lillian Hellman, Arthur Miller, Edward Albee, August Wilson, or Ntozake Shange.

ENG 3329 Major American Poet

Examines in detail the work of a single major American poet, placing it within its literary and cultural contexts. Some likely subjects are Whitman, Dickinson, Frost, Eliot, H.D., Williams, Stevens, Lowell, Moore, and Bishop.

ENG 3331 Topics in American Literature

Explores a significant topic in American literature: for example, typology and American art; written women and women writers; realism; humor; the frontier; Southern writing; ethnic American literature.

ENG 3333 Major Figures in African-American Literature

Examines in detail the work of a major African-American novelist, poet, or dramatist; the existing criticism; and the work's historical context and cultural milieu. Considers such authors as Richard Wright, Toni Morrison, Langston Hughes, Zora Neale Hurston, Imamu Amiri Baraka, August Wilson, Lorraine Hansberry, Alice Walker, John Wideman, and Gloria Naylor.

ENG 3334 African-American Novel

Studies the works of a major nineteenth- or twentieth-century African-American novelist. Considers such authors as Francis Harper, Charles Chestnutt, Zora Neale Hurston, Nella Larsen, Toni Morrison, Ralph Ellison, James Baldwin, and Ishmael Reed.

ENG 3335 African-American Literature

Focuses on the development of the tradition, critical paradigms, recurrent themes, and patterns of African-American literature through close readings of selected texts and critics. Considers writers such as Houston Baker, Jr., Henry Louis Gates, Jr., Frederick Douglass, Harriet Jacobs, William S. Braithwaite, Larry Neal, Ralph Ellison, Barbara Christian, Richard Wright, Ishmael Reed, bell hooks, and Audre Lorde.

ENG 3547 Topics in African-American Literature

Considers topics in African-American literature such as women writers, the Harlem renaissance, and autobiographies.

ENG 3583 American Literature and Culture 1
Examines early American cultural patterns as they emerge from a wide variety of texts, including accounts of exploration and settlement; diaries; poetry; Native American oratory and sacred texts; slave, captivity, and witchcraft narratives; political tracts; novels; and letters. Special attention is given to how issues of colonialism, cross-cultural contact, race relations, and the rise of political and national consciousness affected literary art and rhetorical expression from 1492 to 1800.

ENG 3584 American Literature and Culture 2
Focuses on American writing from 1800 to 1900, paying particular attention to the ways in which literary texts reflected, enacted, questioned, and controverted cultural assumptions and constructions in the period. Key issues include nationalism and territorial expansion; libertarian ideology and such practices as slavery, limited citizenship, and restricted franchise; immigration and "nativism"; industrialization and pastoralism.

ENG 3585 Topics in Nineteenth-Century American Literature

Considers such literary and cultural topics as: Transcendentalism; the literature of the Civil War; slave narratives; women's narratives; and the literature of social reform.

ENG 3586 Nineteenth-Century American Prose, 1820-1865

Focuses on the characteristics of the Romantic movement and New England Transcendentalism in the works of the principal prose writers of the period. Studies themes and techniques of such writers as Poe, Hawthorne, Melville, Emerson, Fuller, and Thoreau.

ENG 3587 Nineteenth-Century American Poetry
Explores poetry written in the United States in the nineteenth century. Authors considered may include Dickinson and Whitman; New England poets such as Whittier, Longfellow, Sigourney, and Holmes; Transcendentalism's poetry and prose criticism; African-American poets such as Harper and Dunbar. Topics considered may include poetry and American literary nationalism; gender, sentimentalism, and poetry, abolition and the Civil War in poetry.

ENG 3589 Nineteenth-Century American Prose, 1865-1900

Covers the post-Civil War novel in America, including the realistic and naturalistic movements, and such authors as Twain, Howells, Henry James, Kate Chopin, and Edith Wharton. Includes some notable nonfiction writers, such as Henry Adams and William James.

ENG 3592 Modern American Drama

Analyzes philosophic and aesthetic trends among such playwrights as O'Neill, Williams, Miller, Albee, Hellman, and Simon.

ENG 3595 Individual Modern American Novelist

Examines in depth the work of a major figure in twentieth-century American fiction, focusing on the cultural context out of which he or she emerges.

ENG 3596 Individual American Writer
Topics to be announced.

ENG 3598 Modern American Prose

Includes close examination of such prose forms as the essay, short story, autobiography, biography, history, and novel. May select writers with some special purpose in view, but focuses on those generally representative of the 1912-1950 period.

ENG 3610 Contemporary American Fiction

Surveys major developments in American fiction of the period from roughly 1945 to the present against the cultural background of that period. Considers such categories as southern fiction, Jewish fiction, black fiction, women's fiction, and multicultural fiction since the civil rights era, and such writers as Mailer, Kerouac, Welty, Malamud, Didion, Gaines, Silko, and Chin.

ENG 3700 Ph.D. Seminar in American Literature

Explores in detail a writer, theme, genre, cultural context, approach, or other aspect of American literature. MA students may enroll with permission of the instructor.

British Literature

ENG 3416 Twentieth-Century British Drama

Explores the evolution of British drama from Shaw to Tom Stoppard, giving particular attention to the influence of Ibsen and later European dramatists; the Irish influence of Yeats, Synge, and O'Casey;

the traumas of two world wars; and the steady growth in the variety and power of British dramatic productions. Also considers such writers as John Galsworthy, D.H. Lawrence, Samuel Beckett, John Osborne, Terrence Rattigan, Harold Pinter and Caryl Churchill.

ENG 3548 Topics in Renaissance Literature

Considers specific topics in the literature of the sixteenth century, such as the sonnet sequence, and utopian and travel literature.

ENG 3549 Topics in Seventeenth-Century Literature

Considers specific topics in literature from 1600 to approximately 1700, such as metaphysical poetry, religious poetry and prose, and drama.

ENG 3551 Chaucer

Focuses on the works of Chaucer in their late medieval setting; examines both the intertextual tradition that produced such texts as The Book of the Duchess, The Canterbury Tales, and Troilus and Criseyde, and the literary context in which Chaucerian texts have been and continue to be read. Critical issues may include questions of voice and persona, the relationship of author to text, the problems of influence and genre, and medieval views of race, class and gender.

ENG 3553 Medieval Literature

A survey of the major works of the medieval period, excluding Chaucer. The focus is on texts in Middle English from the 12th c. through the 15th, and covers the range of available genres and forms, including the short religious and secular lyric, debate poetry, the dream vision, religious prose, the romance, 15th c. Chaucerian imitations, and 15th c. ballads. The critical focus may include questions and problems of sources, influence, genre, voice, and the representation of the subject.

ENG 3554 Topics in Medieval Literature

Topics may include the following: Anglo Saxon literature (including poems such as Beowulf, Judith, The Wanderer, The Seafarer, and a selection of prose); the poems of the Pearl Poet (Sir Gawain and the Green Knight, Pearl, Cleanness); women and/in the Middle Ages; medieval literature and medievalism; the medieval romance, Malory's Morte Darthur; religious, mystical, and didactic works; medieval travel literature; William Langland's Piers Plowman.

ENG 3555 Renaissance Literature

Studies major prose, poetry, and dramatic literature by such authors as Erasmus, Wyatt, and Surrey, More, Sidney, Marlow, Spenser, Raleigh, and Shakespeare.

ENG 3558 Shakespeare's Tragedies

Great in themselves, these plays are central to our present sense of "self" and the center of critical debate in most areas of literary theory. Plays studied include King Lear, Hamlet, and Macbeth.

ENG 3559 Shakespeare's Comedies

Comedy was a mode of thinking congenial to Shakespeare's nature, and he wrote more comedies than he did tragedies or histories. Selected plays from the beginning to the end of his career include Much Ado About Nothing to Twelfth Night, All's Well, and The Tempest.

ENG 3560 Topics in Shakespeare

Addresses special issues, such as Shakespeare's new hybrid form the tragicomedy (Measure for Measure, Winter's Tale, and The Tempest), or his nondramatic works (Sonnets, "Rape of Lucrece" and "Venus and Adonis").

ENG 3561 Seventeenth-Century Literature

Covers major prose, dramatic literature, and poetry of the seventeenth century, including: Bacon, Behn, Cavendish, Hobbes, Browne, Bunyan, Donne, Herbert, Jonson, Marvell, and others.

ENG 3562 Milton

Presents Milton's poetic and intellectual achievement through analysis of his major works. Emphasizes *Paradise Lost* as an expression of Renaissance humanism and the culmination to the epic tradition.

ENG 3563 Restoration and Early Eighteenth-Century Literature

Studies neoclassical drama, poetry, and criticism, including Restoration drama, Dryden, Pope, Swift, Finch, Addison, Steele, and Gay.

ENG 3565 Topics in Eighteenth-Century Literature

Explores a topic, theme, or genre in eighteenth-century British literature, such as satire or the epistolary novel; may also explore intensively the work of one major writer of the period.

ENG 3566 Eighteenth-Century Novel

Focuses on novels by Defoe, Fielding, Richardson, Walpole, Behn, Smollett, Sterne, and Austen.

ENG 3568 Romantic Poetry

Surveys representative forms and works of the major poets of the English Romantic Period (1798-1832): Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. Studies the poetry in the historical and intellectual context of its time.

ENG 3570 Topics in Romanticism

Explores a topic, theme, or genre in Romantic literature, such as Romantic autobiography or Romantic conceptions of the poet; may also explore intensively the work of one major British writer of the Romantic era.

ENG 3571 Victorian Literature

Treats such topics as Victorian masculinities; female poetic identity; the move to aestheticism and Decadence in the latter 19th century; resemblances of the 1890s to our own fin-de-siecle. Considers such figures as R. Browning, E. B. Browning, Christina Rossetti, Florence Nightingale, Swinburne, Pater, Stevenson, Wilde, H. G. Wells, and Freud.

ENG 3572 Victorian Poetry

Focuses on Tennyson, R. Browning, E. B. Browning, Arnold, Christina Rossetti, D. G. Rossetti, Swinburne, Hopkins with special attention to issues of gender, poetic form, and the movement toward modernism.

ENG 3573 Victorian Novel

The Victorian novel emphasizing recent critical approaches (e.g. gender studies, new historicist, psychoanalytic): considers such figures as C. Bronte, E. Bronte, Dickens, Eliot, Gaskell, Trollope, and Hardy.

ENG 3575 Topics in Victorian Literature

A focus on special topics such as gender issues, the 1890s, Victorian fantasy and science fiction.

ENG 3628 Topics in Twentieth-Century British Literature

Explores such topics in twentieth-century British literature as the rise of modernism, the psychological novel, imagism, post-colonial and postmodern fiction.

ENG 3701 Ph.D. Seminar in English Literature 4 QH
Explores in detail a writer, theme, genre, cultural context, approach, or other aspect of English literature. MA students may enroll with permission of the instructor.

Creative Writing

ENG 3347 Creative Writing Workshop
Comprises advanced work in creative writing.
Prereq. ENG 3350, ENG 3351 or permission of instructor.

ENG 3350 Creative Writing 1
Focuses on prose fiction.

ENG 3351 Creative Writing 2
Focuses on poetry.
ENG 3605 Independent Study in Creative Writing
By arrangement.

ENG 3606 Creative Writing Thesis 6 QH
By arrangement.

Criticism

ENG 3315 Contemporary Critical Theory
Introduces the study of modern and contemporary literary theory and criticism, including "New Critical," Marxist, feminist, psychoanalytic, structuralist, poststructuralist, phenomenological, and other approaches.

ENG 3317 Topics in Criticism
Examines such topics in critical theory as narrative, cultural criticism, representation, reader response, feminist theory, postcolonial studies, and comparative literature.

Film Studies

ENG 3609 Contemporary Film
A survey of contemporary film, both American and international. We will study the major new developments in film, from the new ethnic filmmaking to the recent turn to gender and

sexuality. In addition, the course engages some of the central critical and theoretical issues and debates in film studies, from spectatorship to post-modernism. A large part of the course will be devoted to the analysis of visual and narrative form and to the link between form and meaning.

ENG 3611 American Film
A history of American film from the beginnings to the present. We will pay particular attention to the way we negotiate social norms and values, reproduce or contest dominant ideologies, and represent (or fail to represent) their historical movement. Films from *Birth of a Nation* to *Citizen Kane* to *The Godfather* to *Thelma and Louise*.

ENG 3612 Film Studies
Introduces the basic methods of film analysis, the history of cinema, and recent theoretical debates within film studies. Provides familiarity with ways of analyzing films in terms of editing, shot composition, framing, mise-en-scene, and the like, with the historical changes in Hollywood and in international cinema, and with such current theories as structuralism and semiotics.

ENG 3613 Topics in Film
Focuses on some specific dimension of film studies—a genre of film such as film noir, a director like Alfred Hitchcock or Francis Ford Coppola, a film movement like Expressionism or social realism, or a particular historical moment in film history such as post-1967 Hollywood. Topics chosen determine texts and films.

Independent Studies

ENG 3601 Master's Thesis 6 QH

ENG 3602 Independent Study
By arrangement.

ENG 3607 Independent Study 1 QH
By arrangement. Topic to be determined by student and advisor.

ENG 3708 Ph.D. Dissertation 0 QH

ENG 3798 Master's Continuation 0 QH

ENG 3799 Ph.D. Continuation 0 QH

Linguistics

ENG 3321 Linguistics and Literature

Introduces stylistics, the study of formal properties of poetry and prose. Considers general questions: Are there constraints on creativity? What relationship holds between form and meaning? What is the nature of metaphor? How can we characterize author style, genre style? Analyzes texts of representative major writers for linguistic features. Focuses on how linguistic methods can contribute to critical response.

ENG 3322 Linguistics and Writing

Explores topics in textuality and text cohesion, distinguishing unified text from a string of unrelated sentences. Studies lexical, semantic, and syntactic cohesion, paragraph patterning, and information flow. Analyzes diverse non-fictional prose selections for style features. Considers expressive, persuasive, scientific, informative, and exploratory forms of discourse.

ENG 3400 Issues in English Grammar

Explores the nature and rules of grammar. Examines and enlightens concepts and definitions in traditional grammar using tools from contemporary linguistic theory. Contrasts the role of rules as prescriptive conventions or descriptive devices. Considers how sentence structure contributes to meaning in language. Examines the relationship between grammar and dialect, question of standard and nonstandard English, and notions of linguistic competence and linguistic performance.

ENG 3401 Introduction to Semantics

Examines how language constructs meaning. Explores various linguistic levels where meaning resides: word, sentence, intonation, stress, and discourse. Considers non-linguistic factors affecting meaning: context, pragmatic knowledge, and the rules of logic. Investigates such questions as: What are the minimal units of meaning? What elements go into determining meanings? Are there any meaning universals? Are meanings fixed?

ENG 3402 History of The English Language

Traces the development of English using linguistic readings and historical documents (letters, journals, literary selections) from various periods and representing a range of styles (formal to informal). Studies changes in the sound system, inflectional system, vocabulary, and syntax of English, as well as the development of prose style. Considers issues

in language change: the influence of foreign invasion, relocation, dialect dominance, and literacy.

ENG 3403 Topics in Linguistics

Explores such issues in linguistics as the lexicon; dialect; metaphor; language acquisition; and language and social structure.

ENG 3404 Introduction to Linguistics

Poses the question "What is language?" and takes both an internal and external approach to an answering. Examines the internal organization of linguistic units (phonemes, morphemes, phrases, sentences) in languages as diverse as Arabic, Breton, Xhosa, and Zuni. Discusses how language is learned and used, exploring biological, computational, philosophical, and social facets. Introduces a linguistic perspective on topics of language controversy, including literacy, sexism, language change, and the "innateness question."

ENG 3406 Introduction to Syntax

Explores aspects of language structure through the framework of contemporary syntactic theory. Offers a technical but introductory exploration of the form, function, and relationships of words, phrases, clauses, and sentences. Introduces tools of linguistic analysis and a methodology for examining our internalized knowledge of English sentence composition. Considers language from the perspective of learnability and universal grammar.

ENG 3422 Gender and Language

Considers language as a reflector of social practice and as a means of influence and expression of power. Through a review of current research, explores such questions as "Is language inherently biased?" "Do men and women use language differently?" Covers speech styles, patterns of conversational interaction, and language use in institutional settings: the courtroom, the doctor's office, the business meeting, the TV talk show, the university classroom. Reviews material from diverse fields including politics, advertising, news media, and literature.

ENG 3702 Ph.D. Seminar in Linguistics

Topic varies. MA students may enroll with permission of the instructor.

4 QH

Literary Studies

ENG 3358 Topics in Nonfiction Prose

Examines writings in nonfiction prose in such areas as biography, history, science, and technology. Varies according to the design of the instructor.

ENG 3361 Topics in Literary Study

Focuses on literature on a thematic, formal, or generic basis. May include: black women writers, poetry of nature.

ENG 3419 Topics in Genre

Examines such topics in genre criticism as biography, autobiography, satire, and children's literature.

ENG 3420 Contemporary Poetry

Examines the themes, techniques, and cultural contexts of postmodern American and British poetry, 1950-present. Considers a range of representative poets and poems; such groups as Beat, neosurrealist, African-American, and L=A=N=G=U=A=G=E poets; such practices as field composition and performance poetry; and such issues as appropriation and the intersections of modernism and postmodernism.

ENG 3421 Modern Poetry

Examines the themes, techniques, and cultural contexts of modern American and British poetry, 1900-1950. Considers a range of representative poets and poems; such "movements" as imagism, proletarian poetry, and the Harlem Renaissance; such practices as collage poetics; and such issues as canon formation and the intersections of modernism and postmodernism.

ENG 3622 Topics in Drama

Examines such subjects as tragic drama, comic drama, and absurdist drama.

ENG 3623 Topics in Poetry

Examines such subjects as epic poetry, the lyric, poetry of the seasons, and confessional poetry.

ENG 3624 Topics in Fiction

Examines such subjects as short fiction, the romance, and the short-story cycle.

ENG 3625 Topics in Literary Relations

Explores relations among national literatures. Covers such subjects as modernism in England and

America, and romanticism in nineteenth-century England and America.

ENG 3626 Topics in Literature and Other Disciplines

Examines such subjects as literature and the visual arts, literature and psychology, and literary impressionism.

ENG 3627 Topics in Comparative Literature

Examines such subjects as classical backgrounds, nineteenth-century European novel, and post-modernist fiction.

ENG 3703 Ph.D. Seminar in Literary Studies

4 QH

Topic varies.

Technical Writing

ENG 3348 Materials and Methods for Technical Writing

Allows students to research a variety of topics that are germane to teaching, corporate training, and improving one's own technical writing skills. Explores sources of information available to scientific and technical communications, including on-line databases, conventional printed sources, and personnel. *Students should plan to take this course early in their graduate studies.*

ENG 3349 Workshop in Writing for Publication

Evaluates published articles in scientific, technical, and professional journals and magazines for content, style, tone, format, and mechanical details. Analyzes the article's success, its professionalism, its appropriateness and timeliness, and the professional standards of the journal. Provides for students to research, write, and revise an article for submission to a professional journal of their choice, and for the class to review and edit these articles before submission. Aims at having an article accepted for publication.

ENG 3352 Writing for the Professions

Offers intensive instruction in writing for various professions. The professional focus changes each quarter, and students may repeat this course to take advantage of the changing focuses. The professions include business writing, biomedical writing, marketing writing, science writing, financial writing, proposal writing, and corporate communication strategies.

ENG 3354 Technical Writing

Concentrates on communicating scientific and technical information to a variety of audiences. Provides practice in the different aspects of the technical process: analyzing the project, gathering information, organizing, designing layout and graphics, writing, revising, and using feedback. Offers opportunities to write several forms of technical communication: proposals, memos, short pieces, and oral presentations, as well as a long technical report. *This introductory course is a recommended prerequisite for all other courses.* Limited to students in the Master of Technical and Professional Writing Program.

ENG 3355 Topics in Technical Writing

Focuses on specialized topics in professional communication. Topic varies each quarter.

ENG 3356 Technical Writing Theory and Practice

Examines systematically various theoretical approaches to technical writing as discourse and discipline. Differentiates the aesthetics of technical writing from other forms of discourse through critical analysis of professional writing strategies, based on current theory and research. Allows students to put theory into practice by writing a technical document and a document exploring theoretical issues.

ENG 3364 Style and Grammar in Technical Writing

Provides students with the opportunity to explore stylistic choices and their possible legal and readability ramifications, and the opportunity to grapple with grammar issues.

ENG 3365 Professional Presentations

Provides technical and professional writing students with the ability and understanding to make effective professional presentations. Surveys oral communication skills and compares them with written communication skills. Evaluates other types of presentations for their usefulness in technical communication.

ENG 3366 Ethics of Technical and Professional Communication

Explores various philosophical and ethical issues inherent in the practice of technical communication. Takes the position that writing is a political act and considers the questions of ethics and values likely to arise for technical communicators in the course of their work. Expects readings to lay an

interdisciplinary foundation for exploring these questions, drawing on the principles of philosophy, semantics, rhetoric, pragmatics, and psychology. Aims to prepare students for long-term careers as humanists in a technological environment.

ENG 3367 Managing Technical Publications

Introduces students to the theory and practice of managing the technical publications function within various organizational settings. Class sessions consist of a variety of activities designed to provide experiential learning of management communication techniques—small group meetings, executive reports with discussions, workshops, group and individual exercises, and case studies.

ENG 3368 Writing for the Computer Industry

Provides the opportunity to write and edit professional-quality computer documentation. Begins with basic instruction sets, increases in difficulty, and prepares students to write a user's guide as a major project for the quarter. Focuses on techniques for creating *readable* documentation, including attention to formatting, graphic design, and text organization.

ENG 3369 Graphic Design for Technical Writers 1

Introduces the fundamentals of graphic design communication. Covers the basics of typography, illustration, photography, color, and layout techniques through lectures, presentations, class discussions, and assignments/critiques. Presents an overview of the creative and production processes as well as an explanation of the basic tools and terminology needed to effectively communicate with print design and production professionals.

ENG 3370 Technical and Scientific Editing

Explores the fundamentals of editing as they apply to science, technical, and engineering writing. Covers the role of the editor in business, industry, and the sciences; basic editorial services such as copy and content editing, production editing, and project editing; the editor as writer and interviewer; and science interpretation and technical translation.

ENG 3371 Pascal for Technical Writers

Introduces Pascal, emphasizing writing structured programs using loops, decision statements, procedures, and functions. Data types include integer, real, char, boolean, and one- and two-dimensional arrays.

ENG 3372 Graphic Design for Technical Writers 2

Considers the specifics of project management and working with design and production professionals in a non-studio course. Includes an analysis of the roles and responsibilities of writers, editors, designers, illustrators, photographers, production artists, typesetters, printers, and other professionals involved in book design and production. Covers budget considerations, scheduling, and manufacturing processes related to publishing. *Prereq. ENG 3369 or permission of instructor.*

ENG 3373 On-line Documentation

Introduces students to the principles of writing on-line documentation including error messages, HELP messages, on-line reference guides, and tutorials. Explores the many tools available for developing on-line material, including hypertext.

ENG 3604 Independent Project, Technical and Professional Writing

Provides for preparation of portfolio of technical and professional writing done for final project. Limited to students in the Master of Technical and Professional Writing Program.

ENG 3621 C Programming for Technical Writers

Teaches the basic concepts of C to students in the Master of Technical and Professional Writing Program. Covers use of the vi editor, data types, assignment statements, looping, conditional statements, functions, arrays, structures, pointers, and operations on bite.

ENG 3630 Corporate Communication Strategies

Links the challenges and opportunities of corporate writing to three domains: the instrumental—focusing on the skills and techniques of effective business writing; the dialogic—planning strategies based on corporate culture and context; the self-reflective—considering the larger issues of motivation, authority and trust as aspects of managing by communicating.

Technical Writing Training Program

ENG 3614 Principles of Technical Writing

Introduces the student in the Technical Writing Training Program to the fundamental concepts and principles of technical writing. Includes the

definition of technical writing, audience analysis, organization, clarity, and definitional techniques. Provides practice editing and revising existing documentation. Integrates discussion and sound writing techniques with practice in writing documentation. *Limited to students in the Technical Writing Training Program.*

ENG 3615 Writing for Computer-Related Industries

Focuses on document preparation and production and on the job environment. Teaches how a documentation department is structured, the phases a document passes through, and how to deal with other departments such as research and development or marketing. Discusses such topics as communication skills, what to expect from other writers and managers, and how to excel within a high tech environment. *Limited to students in the Technical Writing Training Program.*

ENG 3616 Applied Software Writing

Introduces a range of advanced concepts and processes relating to technical documentation. May include text processing, on-line help, preparing indices and cross-references, and documentation bases. *Limited to students in the Technical Writing Training Program.*

ENG 3617 Computer Hardware and Organization

4 QH

Introduces students in the Technical Writing Training Program to computer hardware components and how they are organized into a computer system, the components of which include disks, magnetic tapes, printers, the CPU, and memory. Teaches data representation, acquaintance with assembly language, and how a computer stores, addresses, and executes instructions. Explains files, including records, fields, and indexed files. Introduces elementary data structures. *Limited to students in the Technical Writing Training Program.*

ENG 3618 Programming in C ++

4 QH

Teaches structured programming using C++. Stresses correctness, clarity, and reliability of programs. Offers individual guidance in writing programs and access to Northeastern's computer systems for running programs. *Limited to students in the Technical Writing Training Program.*

ENG 3619 Interface Design

4 QH

Examines components of and strategies for interface design and the issues important for

technical writers. Course content changes to keep pace with the changing technology. *Limited to the students in the Technical Writing Training Program.*

Writing

ENG 3308 Writing and Reading: Composing Processes

Provides teachers with the opportunity to develop a coherent theory of reading instruction coordinated with teaching writing. Recommended for teachers who have previously taken a course in the theory and teaching of writing.

ENG 3309 Writing and Learning Across the Curriculum 6 QH

Explores in-depth how writing may be used to promote thinking and learning across a wide variety of disciplines. Intended primarily for high school and college instructors in the humanities, social sciences, and natural sciences. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3310 Writing Programs in Schools and Colleges

Examines both the nature of writing programs in schools and colleges and the issues that curricular changes raise for these institutions. Intended for English teachers on all levels who wish to become composition leaders in their schools. Presupposes extensive coursework in composition theory and practice. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3312 Composition Studies

Focuses on theories about writing, reading, and learning, and how these theories are played out in practice in often competing and contradictory ways. Examines and critiques the four paradigms that dominate composition theory and practice today: the classical model, the expressivist model, the cognitivist model, and the social-constructivist model.

ENG 3353 Topics in Writing

Topics may include the following: literacy and literacies; basic writing; issues of gender, race, and class in the classroom; writing assessment; collaborative learning.

ENG 3357 Computers and Writing

Explores the two major uses of computers in writing instruction: word processing and computer-assisted instruction. Concentrates on the rudiments of word processing, hands-on experience, classroom exercises, and teaching strategies. Includes demonstrations of prewriting, organizing, and revising software, and strategies for developing CAI in composition, and a brief introduction to a programming language. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3359 Writing Workshop 1

Provides advanced training in varied forms of writing. May include such specialized areas as fiction, poetry, professional writing, and writing for academic administrators. Requires intensive student writing and extensive instructor comment. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3380 Prose Writing 1

Surveys writing of various types of nonfiction prose, including reviews, reports, biography, commentary, research, personal narrative, travel, and others developed by the participant in consultation with the instructor. Focuses on concepts of content, point of view, organization style, and stages of composition. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3381 Prose Writing 2

Continues ENG 3380. Attempts to reinforce writing theory and practice, to introduce the professional concerns of writers, and to prepare writing for possible publication. Provides for participants to refine techniques of composition and to examine the rhetorical methods of description, narration, exposition, and persuasion. Reviews such writers' markets as newspapers, popular magazines, and scholarly journals. When possible, will feature professional writers as guest speakers. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3382 Responding to Learners

Examines and puts into practical use a variety of methods of analyzing writing. Studies both professional and student writing. Provides the tools for analyzing and improving student writing, assessing the writing of their students, and designing appropriate writing assignments and activities. Provides an opportunity to begin the

development of an integrated writing curriculum from the elementary to the college level.

ENG 3383 The Composing Process

Based on the premise that the key to teaching writing is teaching revision strategies. Participants look at the research studies of elementary, secondary, and college students and examine manuscripts of professional writers such as E. B. White. Focuses on both the theory and practice of revising. Covers understanding students' assumptions about the writing/revising process; teaching revision strategies; using student writing to teach revision; responding to student writing within the context of revising; and analyzing personal revision strategies. Explores how participants can use what they know about their own revising strategies to teach revision. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3385 Writing and Reading in Content Areas

Examines some characteristic student and professional writing in the humanities, sciences, and social sciences. Attempts to help participants see how students can use writing as a way of knowing and learning, not just in the English class but, for example, in the biology, history, or even mathematics class. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3389 Case Study Analysis 1 QH

Provides for participants who have prepared ENG 3391 projects to present their findings, draw their conclusions, and discuss the implications of their research for further study. Guides participants toward possible publication of their work in relevant composition journals. Concludes the ENG 3389, ENG 3391, and ENG 3392 sequence. Usually given only through the Institute on Writing and Teaching at Martha's Vineyard.

ENG 3391 Fieldwork

Allows participants to conduct the independent research planned in ENG 3392. Provides resources available for this research at the home institution, including the participants' individual teaching practices, course or departmental curriculum, the writing of their students and of students in other classes, the practices of other teachers and administrators, as well as published books, reports, and articles on composition. Provides for student to collect, collate, and interpret data according to the guidelines established at the institute and then prepare a project in which they present their findings. Usually given only through the Institute of Writing and Teaching at Martha's Vineyard.

ENG 3392 Case Study Design 2 QH

Prepares participants for research to be conducted in ENG 3391 during the academic year at the home institution. Examines some published case studies of teaching and writings and explores relevant methods of data analysis, observation techniques, interview and questionnaire construction, sampling procedures, experimental design, and writing protocol analysis. Usually given only through the Institute of Writing and Teaching at Martha's Vineyard.

ENG 3620 Rhetoric

Introduces students to the ideas and scholarship of the major periods of rhetorical developments and allows students to explore the definition of "rhetoric" in ways most meaningful to individual interests.

ENG 3704 Ph.D. Seminar in Writing and Rhetoric 4 QH

Topic varies. MA students may enroll with permission of the instructor.

History

All courses carry three quarter-hours of credit except seminars, which carry four quarter-hours, and other courses where noted.

HST 3241 Methodology

Explores the objectives, methods, and resources of the historian.

HST 3242 European Historiography

Analyzes the development of historical writing from ancient times to the present.

HST 3243 American Historians

Covers the writing of American history by Americans, from colonial times to the present, with emphasis on changes in both form and substance.

HST 3244 Global Historiography

Reviews the literature on world history, focusing on authors such as Oswald Spengler, Arnold Toynbee, and William McNeill, and on the field of world history since 1960. Addresses the principal methods, paradigms, and interpretations in world history for the premodern, early modern, and recent periods.

HST 3251 Theory and Methodology

An advanced review of the theories and methods utilized by historians, intended to develop students' facility in assimilating, criticizing and generalizing the analyses of historians in fields ranging from economic and demographic history to intellectual cultural history.

HST 3252 Seminar in Issues of Teaching Social Issues**4 QH**

Using a specific "real world" issue as a case study, the seminar will explore the problem from a variety of Social Science disciplines, each bringing its own methodologies and approaches to bear on the issue. Students from participating departments will work on interdisciplinary research teams to produce coherent analyses of the problem and (where appropriate) action plans. Required of all students for Standard Certification in Social Studies.

HST 3290 Topics in Cultural History

(Group 1, 2, or 3) Special Topics in Cultural History.

HST 3306 The Renaissance (Group 1)

Discusses European political and cultural life from the thirteenth to the seventeenth centuries, with attention to humanism and to the rebirth of classicism in literature and the arts.

HST 3308 Topics in Early Modern Europe (Group 1)

Examines recent interpretations of and approaches to such topics as the Renaissance and Reformation; the "crisis" in Europe, 1540-1660; gender roles; the French Revolution; and popular culture. Emphasizes recent monographs and journal literature. Requires oral presentations and short critical essays.

HST 3309 World War I (Group 1, 2, or 3)

A detailed analysis of the causes, prosecution, and consequences of the twentieth century's pivotal conflict. From a global perspective, the course will explore diplomatic and political, economic and financial, social and psychological, and cultural, intellectual, and religious aspects of the war and will evaluate the interpretive frameworks and conclusions attached by historians to it.

HST 3345 Hitler's Germany (Group 1)

Studies the history of the Third Reich, including an in-depth analysis of the process by which the political motives and methods of the Nazis ultimately won the support of the German people.

HST 3384 Seminar in Twentieth-Century Europe (Group 1)**4 QH**

Studies a selected controversy in contemporary European history.

HST 3385 Seminar in European Social History (Group 1)**4 QH**

Focuses on Britain, France, and Germany in the nineteenth and early twentieth centuries and looks at history "from below." Examines comparative issues in European social history. Includes the nature of social protest, the rise of organized labor, and the impact of war and revolution on the lives of ordinary people.

HST 3387 Seminar in 19th & 20th Century Britain**4 QH**

Selected topics for research and writing.

HST 3388 Seminar in Work, Culture and Society in Modern Europe**4 QH**

Examines the history of work in nineteenth and twentieth century Europe with special attention to France, Britain, and Germany. Work is examined as both cultural and economic activity.

HST 3397 Seminar in Comparative Labor History (Group 1)**4 QH**

Analyzes issues in the history of the European labor movement, focusing on nineteenth- and twentieth-century Britain, France, and Germany. Includes the meaning of the concept of class in labor history; labor movements and politics (working-class conservatism and working-class radicalism); the place of women in the working class and in the labor movement; and worker responses to mechanization, automation, and scientific management in the twentieth century.

HST 3399 Seminar in Approaches to Women's History (Groups 1, 2, or 3) 4 QH

Focuses on current issues in women's history and the methods historians use to study women's historical roles in the market place, work force, political arena, and domestic scene in Europe, Asia, the United States, and Latin America. Emphasizes the importance of comparative and interdisciplinary approaches to the history of women. Includes lectures and discussions with specialists using various approaches, assigned reading, and an independent project.

HST 3405 Colonial America: The Eighteenth Century (Group 2)

Covers the expansion of the English colonies in the New World, the development of political and social institutions, and the sources of friction with England to 1763.

HST 3410 Topics in American Reform (Group 2)

Studies movements to change aspects of American society.

HST 3413 Topics in the Civil War and Reconstruction (Group 2)

Analyzes key issues surrounding the events leading up to the Civil War, the war itself, and the Reconstruction period.

HST 3421 Political Change in Twentieth-Century America (Group 2)

Analyzes the growth of governmental function and structure, emphasizing the evolution and administration of leading policy concerns of the current century, changes in federalism and intergovernmental relations, and patterns of popular political participation and thinking.

HST 3434 United States Social History in the Twentieth Century (Group 2)

Examines the recent literature on such topics as family, gender, class, migration, ethnicity, race, work, leisure, fertility, health, mortality, deviance, and social policy.

HST 3436 American Education in Historical Perspective (Group 2)

Examines the expansion of public education from the passage of compulsory schooling laws to the establishment of the multi-university and the problems facing American education in the 1990s. Gives attention to views that common schooling and land-grant colleges were part of the larger

movement to extend democracy and to the ideas of reformers such as Horace Mann and Henry Barnard. Examines challenges to these propositions in detail.

HST 3437 Land and People in the Twentieth Century (Group 2)

The primary goal of this course is to examine the development of complex environmental systems and the efforts to alter, change, and sometimes destroy these systems to achieve human goals in the twentieth century. By focusing on the present century, the course will emphasize the impact of human development on complex natural systems such as land, water and air and the introduction of new chemical substances during the post-war periods into these systems. At the same time, the vast influence of the conservation movement in America's history will be studied by reading Henry David Thoreau, John Muir, and Aldo Leopold.

HST 3438 Cultural History of the United States (Group 2)

Examines the interrelationships of popular and elite literature, paintings, prints, photography, film, architecture, domestic furnishings, and other sources of information that illuminate the cultural history of the United States.

HST 3440 African-American History 1 (Group 2)

Covers the history of African-Americans to 1900, with emphasis on the role of black people in slavery and freedom.

HST 3441 African-American History 2 (Group 2)

Considers African-American history since 1900.

HST 3450 Boston as a City (Group 2)

Examines historic Boston from 1822 to the present. Emphasizes Boston's early growth as a city, the Hub as a center of pre-Civil War reform, the coming of the Irish, Boston as America's Athens, the revolutionary shift from Yankee to Irish political domination, the flamboyant era of James Michael Curley, and the development of the "New Boston."

HST 3460 Life at Sea (Group 2)

Examines the role of the individual at sea through history and literature. Emphasizes the concepts of shipboard law and authority as well as observations on the notion of the "voyage" and the maturation process. Requires an all-day Saturday field trip.

HST 3480 Seminar in American History (Group 2) 4 QH
Offers research and writing on selected aspects of American history.

HST 3481 Seminar in Colonial and Revolutionary America (Group 2) 4 QH
Offers research and writing on selected topics in American history prior to 1789.

HST 3482 Seminar in American Governmental History (Group 2) 4 QH
Concentrates attention on a particular problem or theme in American governmental history, emphasizing individual student research and writing.

HST 3485 Seminar in African-American History (Group 2) 4 QH
Offers research and writing on an aspect of African-American history.

HST 3486 Seminar in Recent American History (Group 2) 4 QH
Studies special topics from the period 1896 to the present in detail. Requires presenting a research paper on a major person, action, or movement.

HST 3506 Islam and Christendom, 500-1500 (Group 1 or 3)
A critical examination of the formative centuries of conflict and cooperation between Muslims and Christians in southern and eastern Europe, the Mediterranean, and the Middle East. Emphasis will include the mutually transformative nature of these contacts in many spheres of endeavor, and the ways in which these contacts and their legacy to Christian and Muslim contributed to self-definition and to the perception of each by the other. Broader themes concerning the nature of exchanges between different cultures will also be considered.

HST 3509 The African Diaspora (Group 3)
Explores black political thought in Africa and the Americas during the nineteenth and twentieth centuries in the context of modern nationalism and capitalism.

HST 3512 Modern Middle East (Group 3)
Studies the Middle East in the twentieth century.

HST 3520 Third World Women (Group 3)
This course analyzes the role of women in a number of non-Western developing societies. The principal sources are the life histories of women from various

social and economic classes in Indonesia, China, Japan, South Asia, Sub-Saharan Africa, the Middle East, North Africa, Latin America, and Black America. Attention is given to analyzing the ways in which culture, economic structure, and role expectations shape the opportunities open to women in these societies and the choices women make. The relationships between choices and experiences of mothers, daughters, and grand-daughters are explored. Students are required to undertake independent research projects using oral histories and the methodology of life histories.

HST 3523 Modern Japan (Group 3)
Discusses the history of Japan since the fall of the Tokugawa, emphasizing political and economic developments, especially after World War II.

HST 3529 Communism in China (Group 3)
Studies the Chinese Communist movement from its origins in the 1920s to the present.

HST 3530 Seminar in Western Perceptions of China (Group 3) 4 QH
Explores the sources and implications of cultural myths and stereotypes. Focuses on how western images of China developed and how they affected, often negatively, China's relations with the west. Challenges students to develop cross-cultural analytical skills, taking into account the limitations of the observer and the observed, and to engage in acute and conscientious cultural self-reflection.

HST 3531 Population in History (Group 3)
Applies demographic theory to history.

HST 3540 Economic History of the Modern Western World (Group 3)
Analyzes the economic development of the modern Western world.

HST 3551 Caribbean History
History of the Caribbean region in the modern period. Topical focus on political, social and cultural history. The course will proceed by development and comparison of the historical experiences of Spanish-, English-, and French-speaking territories. Some of the themes explored will include: colonial rule, comparative slave societies, abolition and emancipation, cultural life, social movements, 20th century authoritarian politics and economic development models, industrialization and urbanization, and immigration.

HST 3587 Seminar in South American History 4 QH

Research and Writing on special topics in the History of South American Republics.

HST 3593 Seminar in Global Social History (Group 3) 4 QH

Research seminar addressing major issues in social history at the global level. Topics include family, demography, community, ethnicity, class, race, and nation. Research papers will link a selection of these issues across national and continental boundaries.

HST 3600 Introduction to Public History (Group 3)

Surveys career options for historians working outside the academy. Examines the educational, ethical, and legal issues involved in historic preservation, archive and museum management, public policy planning and analysis, cultural resource management, and private sector application of the historian's craft.

HST 3601 Historical Administration (Group 3)

Considers the administration of historical agencies with attention to problems of finance and personnel and to the legal-governmental environment in which agencies operate.

HST 3602 Historical Societies and Archives (Group 3)

Analyzes the varieties of historical societies (local, state, and national) and the kinds of private (business, college, and church) and public (local, state, and national) archives; their activities and procedures; and their similarities and differences.

HST 3603 Historical Exhibits and Museums (Group 3)

Studies approaches, techniques, and special problems in the presentation of history to the public through exhibits, films, and other audiovisual and written media.

HST 3605 Historical Editing (Group 3)

Presents a laboratory for the study and practice of historical editing. Introduces the major collections of edited papers and instructs students in editing historical documents. Gives each student a historical document to prepare for publication. Also covers the editing of history books and journals.

HST 3611 Historic Preservation (Group 3)

Introduces historic preservation, with attention to the history, the philosophy, and the practical problems of preservation.

HST 3612 Studies in Material Culture (Group 3)

Investigates strategies for examining material culture, including architecture, historic archeological remains, and the artifacts of domestic and work lives, as sources for historical study.

HST 3613 Historical Analysis of Public Policy (Group 3)

Introduces the historical study of public policy, concentrating on the theoretical and methodological issues. Substantive illustrations focus mainly on the United States.

HST 3620 Oral History (Group 3)

Discusses the theory and practice of creating, processing, and using primary source material obtained by taping interviews with people whose role in history would otherwise go unrecorded.

HST 3625 Media and History (Group 3)

Explores such topics as the advantages and drawbacks of specific media, the uses and abuses of media in research and teaching, and the construction of media. Requires each student to participate in a research project involving the creation and/or evaluation of historically valid films, slide tapes, and other materials.

HST 3700 Directed Study M.A.T.

Offers assigned reading under the supervision of a faculty member.

HST 3798 Master's Continuation 0 QH

HST 3804 Directed Study in Women's History 4 QH

Offers assigned reading in women's history under the supervision of a faculty member.

HST 3805 Directed Study 1 QH

Offers assigned reading under supervision of a faculty member.

HST 3806 Directed Study 2 QH

Offers assigned reading under supervision of a faculty member.

HST 3807 Directed Study

Offers assigned reading under supervision of a faculty member.

HST 3808 Assigned Reading in Historical Geography

Offers directed study in geography's impact on history. This course may be used to satisfy state requirements in geography for teaching certification in social studies or history.

HST 3811 Thesis

Offers thesis supervision by members of the department.

HST 3812 Thesis

Offers thesis supervision by members of the department.

HST 3813 Thesis

Offers thesis supervision by members of the department.

HST 3819 Tutorial in Teaching

Discusses issues and problems in teaching. This is a required course for all doctoral candidates and should be taken during a quarter when the student is preparing a course in history to teach at the college level. Open to MAT and doctoral candidates only.

HST 3820 Practicum in Teaching

Under the general supervision of a senior faculty member, students teach individual college-level courses within the History Department. Open to MAT and doctoral students.

HST 3824 Fieldwork in History 1

Offers students the opportunity to get practical experience in historical agencies including historical societies, archives, museums, exhibits, restorations, preservation projects, and the like. Requires students to work in the agency ten hours a week for one quarter under the direction of an agency supervisor and departmental advisor.

HST 3825 Fieldwork in History 2

Gives students a second opportunity to acquire practical experience in an historical agency. Requires ten hours a week for one quarter under the direction of an agency supervisor and a departmental advisor.

HST 3826 Fieldwork in History 3

Gives students a third opportunity to acquire practical experience in an historical agency. Requires to ten hours a week for one quarter under the direction of an agency supervisor and a departmental advisor.

HST 3827 Masters Project in Public History 6 QH

Research, development, and completion of a significant project, usually in conjunction with a public history agency, that can be utilized as part of the ongoing programs of such agencies.

HST 3830 Directed Study**3 QH**

Journalism (School of)

All courses carry four quarter-hours of credit unless otherwise specified.

JRN 3100 Intensive Reporting**1 QH**

Prerequisite for Reporting (JRN 3201) taught by journalism print/media instructor. The course will introduce students to the basics of news reporting and writing. Offered summer quarter, six hours per week for three weeks, dates TBA. Carries one graduate credit. Cannot substitute for other required journalism courses.

JRN 3201 Reporting

Offers extensive practice in researching and writing news and feature stories. Analyzes methods of gathering information from government documents and court records.

JRN 3206 Editing

Provides practice in copy editing and headline writing. Presents assignments in photo selection, cropping, and cutline writing. Introduces page layout. *Prereq.* JRN 3201 or permission of instructor.

JRN 3301 Photojournalism

Covers camera procedures along with cropping, assignment techniques, theory, and photo caption methods.

JRN 3421 Television News writing

Covers writing for TV news as opposed to other news media. Importance of the writer-reporter as field-production and writer-producer, and terms and language used in the production of TV news shows.

Includes actual individual production of news shows, field trips to TV stations, and guest lecturers from the TV news media.

JRN 3423 TV News Production

Demonstrates techniques used by the electronic journalist and TV news producer. Provides the opportunity to build a TV news show and to do reporting with portable TV cameras and editing equipment.

JRN 3432 Local Government Reporting

Explores coverage of municipal government, with emphasis on the "beat" approach to reporting public affairs. Emphasizes practical experience in such projects as covering town meetings, board of selectmen, and other commissions and boards.

JRN 3501 History of Journalism

Examines American journalism from European and English roots. Topics include the colonial press, the great personal journalists of the nineteenth century, and the impact of major technological changes in the news media in the twentieth century.

JRN 3508 Law of the Press

Examines libel, invasion of privacy, access to government information, and other legal matters pertinent to the news media.

JRN 3512 Journalism Ethics and Issues

Discusses responsibilities of news media, ethical problems confronting decision makers in various journalistic fields, and the principles found in codes of various professional societies.

JRN 3522 Magazine Writing

Covers writing and free-lancing magazine articles, analyzing magazines as markets, and selecting the best feature format: how-to-do-it, profile, personal experience, human interest, interpretive pieces, and others.

JRN 3575 News Media Management

Examines the organizational structure, production methods, and management procedures of news media companies. Explores interaction among various departments of the company and the company's interaction with the market served.

JRN 3678 Applied Leadership Techniques

Focuses on establishing and maintaining internal communications, coaching, developing employees, understanding motivations, solving problems, making decisions, redesigning jobs, and analyzing leadership styles for news media application.

JRN 3679 Research Methods in Journalism

Offers students an opportunity to develop skills in uncovering a wide variety of source material. Includes deadline, original, investigative and comparative research and shows students how to take advantage of sources ranging from low-tech records in town halls to high-tech information on the Internet.

JRN 3682 Mass Communication Theories

Examines the major theories regarding the process, nature, and influence of mass communications. Studies communications in a theoretical and research-oriented context.

JRN 3684 Literature of Journalism

Studies numerous authors and observers of the journalism profession via their works to provide a wide-ranging view of journalism, its nature and impact.

JRN 3691 Professional Paper

Analyzes a publication by the case method, using theoretical and practical perspectives. The student's paper will analyze the publication's weaknesses and strengths and pose possible solutions.

JRN 3710, JRN 3720, JRN 3730 Topics 4 QH each

Requires advanced work to develop media skills not covered in other classes. May be repeated as subject matter changes.

JRN 3798 Master's Continuation

0 QH

JRN 3870 Graduate Seminar

Offers students an opportunity to critically analyze the journalism profession and to write an article for publication in a journalism review. Discussions focus on recent books and articles about issues in the news media such as corporate ownership, new technologies, and minority recruitment and hiring.

JRN 3890, JRN 3891 Directed Study 4 QH each

Offers students work on individual projects under the supervision of an instructor. May be repeated once.

JRN 3892 NU News Service

NU News Service provides students with the opportunity to report on public policy issues for newspapers in Massachusetts and New England. The live reporting is supplemented by in-class discussion, including speakers in government and media.

Law, Policy, and Society

Core Courses

ECN 3315 Economics of Law and Public Policy

3 QH

Builds on a knowledge of intermediate microeconomic theory in evaluating the impact of laws and public policies. Relies on economic models of behavior and social welfare for economic analyses of government intervention and public policy programs. Studies unregulated market behavior, market failure and public intervention, policy and program evaluation, and the economics of contract and tort law. Limited to Law, Policy, and Society students unless students have special permission from the instructor. *Prereq.* ECN 3010 or permission of instructor.

INT 3248 Introduction to Law, Policy, and Society

3 QH

Introduces students to methodologies and perspectives used in several disciplines in studying law and society. Examines such issues as normative versus formative functions of law, social control versus individual freedom, and legal bases of conflict management in society. The course is coordinated by one instructor but lectures are given by a number of faculty members affiliated with the program to provide students with a variety of perspectives.

INT 3260 Research Models and Methods

3 QH

An examination of the methods and assumptions of research conducted in policy and legal studies. This course explores how to identify researchable questions, how to formulate a set of hypotheses, and how to design, develop, and carry out research projects including a study of qualitative and quantitative techniques for analyzing data.

INT 3261 Research Design and Analysis

3 QH

A continuation of INT 3260 Research Models and Methods. Readings will include works of original research and works on the philosophy of social

science. Particular attention will be paid to the problem of the indeterminacy of social behavior, the ambiguous role of the law, and the conflict between the goals and assumptions of the research and the practical, public uses made of it.

INT 3262 Advanced Law and Policy Studies

3 QH

A critical review of current literature in public policy and sociolegal research. A study of the development of theories and of empirical studies, and their influence on each other. Students will be asked to assess the advantages and disadvantages of research design in each theoretical approach.

LAW 2435 Introduction to Law and Legal Reasoning

3 QH

Introduces students to legal research, including identifying and locating sources of authority for legal argumentation, and a study of the methods of argument and analysis used by legal scholars. Includes a study of how the legal system functions, "makes" law, and influences policy.

POL 3604 Techniques of Policy Analysis

3 QH

Provides a systematic approach to understanding the origins, formulation, implementation, and impact of government policy. Reviews key analytical concepts and competing theoretical perspectives. Considers both the political dimensions of public policymaking and the technical aspects of program design within the "natural history" of the policymaking process. Draws on case materials from a spectrum of policy areas.

SOC 3314 Theories in Law and Policy

3 QH

Studies different interpretations of how the law works and what its foundations are. Examines legal realism, law and economics. Studies different interpretations of how the law works and what its foundations are. Examines legal realism, law and economics, Marxism, critical legal studies, functionalism, conflict theory, and natural law.

Examines the policymaking implication of each of these schools, each school's program for research, and the social issues each school considers worthy of attention.

Recommended Course

PHL 3140 Moral and Political Philosophy 4 QH

An examination of some of the major writings and theories on the moral and political values that underlie many public policy debates. Students will analyze works on the justification of government authority, and obedience to law, the challenges to this view, the legitimate role of government, utilitarianism, Marxism, modern interpretations of the social contract, and libertarian capitalism.

Directed Study and Dissertation

INT 3859 Directed Study in Law, Policy, and Society 2 QH

INT 3860 Directed Study in Law, Policy, and Society 3 QH

INT 3862 Directed Study in Law, Policy, and Society 4 QH

Involves independent reading and research with a faculty member.

INT 3861 Dissertation 0 QH

INT 3798 Master's Continuation 0 QH

INT 3799 Dissertation Continuation 0 QH

Mathematics

MTH 3001 Foundations in Mathematics and Theory 2 QH

The purpose of this course is to provide a prerequisite for the courses: *Analysis of Algorithms and Automata and Formal Languages*.

The topics covered are growth of functions, summations, recurrences, sets (relations vs. functions; graphs, trees), counting and probability. Elementary proof techniques include mathematical induction, pigeon hole principle, contradiction, diagonalization, and propositional logic. *Carries no academic credit towards the Math M.S., M.A.T., or Ph.D. degrees.*

MTH 3002 Modern Algebra 4 QH

An introduction to linear algebra and group theory, covering: vector spaces, linear maps, matrices and matrix algebra, row and column operations and their application to normal forms, determinants, characteristic subspaces, the characteristic and minimal polynomials, and symmetric groups.

MTH 3003 Probability for Teachers 3 QH

Focuses on probability functions for finite and infinite spaces; conditional probability and independence; discrete and continuous probability distributions for one or more random variables; expectations, moments, binomial, Poisson and

normal distributions, Law of Large Numbers, and central limit theorem. Projects relate course content to the practice of teaching mathematics. *Prereq. MTH 1223 or equivalent.*

MTH 3004 Statistics for Teachers 3 QH

Focuses on estimation of parameters, confidence intervals, hypothesis testing, regression, sampling distributions. Projects relate course content to the practice of teaching mathematics. *Prereq. MTH 3003 or equivalent.*

MTH 3005 Number Theory for Teachers 3 QH

Introduces the elementary methods of analytic number theory. Focuses on divisibility, congruences, arithmetical and multiplicative functions, quadratic reciprocity and equivalent formulations of the prime number theorem. Projects relate course content to the practice of teaching. *Prereq. MTH 1330 or equivalent.*

MTH 3006 Complex Analysis for Teachers 3 QH

Focuses on algebra and geometry of complex numbers, concepts of limit, continuity and derivative in the complex domain; holomorphic functions, series, contour integration and applications. Projects relate course content to the

practice of teaching mathematics. *Prereq. MTH 1351 or equivalent.*

MTH 3009 Fundamentals of Analysis 4 QH

An introduction to real analysis and advanced calculus, covering: topology of metric spaces and Euclidean spaces, numerical sequences and series, limits and continuity, differentiation and integration of functions of a single variable.

MTH 3010 Basics of Analysis 4 QH

Investigates differential calculus, including topology of metric spaces, compact and connected sets, continuous maps, uniform convergence, differentiable maps, the inverse and implicit function theorems, Riemann integration, and change of variables. *Prereq. MTH 3009 or placement exam.*

MTH 3101 Real Analysis 4 QH

Integration, differentiation, Lebesgue theory, L_p -spaces, linear functionals, Riesz representation theorem, Hilbert space, Radon-Nikodym theorem, product measures and Fubini theorem. *Prereq. MTH 3010 or equivalent.*

MTH 3102 Algebra 1: Linear Algebra 4 QH

Symmetric, Hermitian and unitary matrices, Jordan canonical form. Quadratic forms, multi-linear algebra, the symmetric, exterior and tensor algebras. Introduction to group theory. *Prereq. MTH 3002 or placement exam.*

MTH 3103 Complex Analysis 4 QH

Examines complex function theory: holomorphic and meromorphic functions, calculus of residues, conformal mappings. *Prereq. MTH 3010 or equivalent.*

MTH 3104 Algebra 2: Groups, Rings, and Modules 4 QH

Continuation of group theory: Sylow theory, examples and classifications of groups of small order. Rings: homomorphisms, ideals, quotient rings, integral domain, extension of rings, unique factorization domain, Chinese remainder theorem, Gauss' lemma. Modules: homomorphisms, submodules, quotient modules, exact sequence, structure of matrices and finitely generated modules over a PID, structure theory of finitely generated abelian groups. *Prereq. MTH 3102 or equivalent.*

MTH 3105 Topology 1 4 QH

Explores elements of point set topology, including general topological spaces, compactness and

connectedness, products, and quotients. Also considers elements of algebraic topology, including homotopy, fundamental group, and covering spaces. Provides applications to simplicial complexes.

MTH 3106 Functional Analysis 4 QH

Analyzes topological linear spaces, normed and Banach spaces, linear functionals, weak topology, linear operators, and Hilbert spaces. *Prereq. MTH 3101.*

MTH 3107 Topology 2: Homology Theory 4 QH

Explores singular homology groups, induced homomorphisms, exact homology sequence of a pair, excision, Mayer-Vietoris sequence, homology of CW complexes, and applications. *Prereq. MTH 3105.*

MTH 3211 Elements of Mathematics for Information Systems I 2 QH

This is the first of a three quarter sequence in linear algebra, discrete math, and calculus. This course treats linear equations and inequalities, slope, graphs, matrices, solution of systems of equations using matrices, the inverse of a matrix, linear programming, simplex algorithm, applications, probability. *Carries no academic credit towards the Math M.S., M.A.T., or Ph.D. degrees.*

MTH 3212 Elements of Mathematics for Information Systems II 2 QH

Sets, graphs, trees, binary search trees, truth tables, combinatorial circuits, Karnaugh maps, finite state machines. *Carries no academic credit towards the Math M.S., M.A.T., or Ph.D. degrees.*

MTH 3213 Elements of Mathematics for Information Systems III 2 QH

The derivative, slope, rate of change, graphing functions, techniques of differentiation, exponential and logarithmic functions, antiderivatives, integration, improper integrals as applied to probability. *Carries no academic credit towards the Math M.S., M.A.T., or Ph.D. degrees.*

MTH 3214 Elements of Mathematics for Information Systems 4 2 QH

Probability, discrete and continuous probability distributions, sampling distributions, hypothesis testing and simple regression. *Carries no academic credit towards the Math M.S., M.A.T., or Ph.D. degrees. Prereq. or coreq. MTH 3213.*

MTH 3222 Applied Statistics 3 QH

This is a basic introductory course in statistical methods for graduate students in various applied sciences. Students will be introduced to the following topics: descriptive statistics, inference for population means, analysis of variance, nonparametric methods and linear regression. Students will be taught how to use the computer package SPSS doing statistical analysis and interpreting computer outputs. *Carries no academic credit towards the Math M.S., M.A.T., or Ph.D. degrees.*

MTH 3311 Mathematical Logic 4 QH

Includes propositional calculus and quantificational logic; first order theories and their models; formal arithmetic; the Godel First and Second Incompleteness Theorems.

MTH 3312 History of Mathematics 4 QH

The course studies mathematics as a living, changing entity through historical eras and across a wide range of cultures. Some of the mathematical topics considered in depth in their historical-social context are drawn from among the following: prime numbers, limits, infinite series, the notion of algorithm, the concept of function, engineering applications. *Prereq. MTH 3009 or equivalent.*

MTH 3321 Algebra 3: Galois Theory 4 QH

Studies finite extensions of fields, automorphisms, structure of finite fields, normal and separable extensions, Galois group, Fundamental Theorem of Galois Theory, cyclotomic fields, solvability of equations by radicals, and applications (for example, coding theory). *Prereq. MTH 3104 or equiv.*

MTH 3326 Topics in Representation Theory 4 QH

Topics in the representation theory of the classical groups, varying according to the interest of the instructor and students. Some possible topics include: root systems, highest weight modules, Verma modules, Weyl character formula, Schur commutator lemma, Schur functors and symmetric functions, Littlewood-Richardson rule. *Prereq. MTH 3104.*

MTH 3330 Topics in Algebra 4 QH

Focusing on various advanced topics in algebra, the specific subject matter depending on the interest of the instructor and the students. Possible topics include: homological algebra, commutative algebra, representation theory, or combinatorial

aspects of commutative algebra. *Prereq. MTH 3104 and MTH 3332.*

MTH 3332 Commutative Algebra 4 QH

Covers prime ideals, localization, integral extensions; primary decomposition; Krull dimension; chain conditions, Noetherian and Artinian modules: and additional topics from ring and module theory as time permits. *Prereq. MTH 3321 or equiv.*

MTH 3341 Ordinary Differential Equations 1: Perturbations 4 QH

Explores existence and uniqueness, Picard iteration, regular singular points, Bessel's equation and other special equations, Sturm-Liouville systems, Fourier series, Eigenfunction expansions.

MTH 3342 Ordinary Differential Equations 2: Dynamical Systems 4 QH

Studies phase flows and vector fields, autonomous and non-autonomous systems, conservative systems with one degree of freedom, classification of linear systems, applications to mechanical vibrations and predator-prey problems.

MTH 3343 Topics in Ordinary Differential Equations 4 QH

Focuses on various advanced level topics in ODE, the specific subject matter depending on the interest of the instructor and students. Possible topics include: Chaos, Delay Equations, and Hamiltonian Systems.

MTH 3353 Partial Differential Equations 1 4 QH

Investigates first-order quasilinear and general nonlinear equations; method of characteristics; second-order hyperbolic, elliptic, and parabolic equations; separation of variables, potential theory, and Fourier transform. Applications include geometric optics; light, sound, and water waves; electric field theory; heat diffusion. *Prereq. Undergraduate differential equations.*

MTH 3355 Partial Differential Equations 2 4 QH

Studies nonlinear second order partial differential equations, method of successive approximations, hyperbolic systems, local and global existence for nonlinear diffusion equations, variational and fixed-point methods for nonlinear elliptic equations. Applications may include gas dynamics, simple models of turbulence, and differential geometry. *Prereq. MTH 3353.*

MTH 3360 Seminar in Applied Mathematics 4 QH

This course will give students of mathematics the experience of utilizing their skills to study problems that arise in industry and other “real-world” settings. It will also provide the opportunity to build on exciting industrial experiences that they may have had (through Co-op or other employment). *Prereq. MTH 1301 and MTH 1311.*

MTH 3361 Numerical Analysis 1 4 QH

Studies topics such as floating point arithmetic, root finding, divided differences, interpolation and approximation, numerical integration, solution of differential equations, and numerical linear algebra. Students are expected to be reasonably proficient in Pascal, FORTRAN, or C. Requires writing computer programs.

MTH 3373 Optimization 4 QH

Convex sets, including polyhedral sets, extreme points, facets and representations; linear programming, including the simplex method, duality, Kuhn-Tucker conditions, and Karmarkar's algorithm; nonlinear programming, including Kuhn-Tucker conditions and Lagrange multipliers.

MTH 3386 Lie Theory 4 QH

Examines Lie groups and Lie algebras, the exponential map, examples, basic structure theorems, representation theory, and applications. Additional topics vary with the instructor and may include infinite-dimensional Lie algebras, algebraic groups, finite groups of Lie type, geometry, and analysis of homogeneous spaces. *Prereq. MTH 3104.*

MTH 3400 Geometry 1 4 QH

Discusses manifolds, differentiable structures, tangent bundles, tensors, vector fields and differential equations, Frobenius integrability theorem, and differential forms. *Prereq. MTH 3010 and MTH 3102.*

MTH 3402 Algebraic Geometry 1 4 QH

Concentrates on the techniques of algebraic geometry arising from commutative and homological algebra, beginning with a discussion of the basic results for general algebraic varieties, and developing the necessary commutative algebra as needed. Considers affine and projective varieties, morphisms of algebraic varieties, regular and singular points, and normality. Discusses algebraic curves, with a closer look at the relations between the geometry, algebra, and function theories. Examines the Riemann-Roch theorem, together

with its many applications to the study of the geometry of curves. Studies the singularities of curves. *Prereq. MTH 3104.*

MTH 3407 Geometry 2 4 QH

Integration on manifolds, Stokes' theorem, singular homology and cohomology, Čech cohomology, deRham cohomology, the deRham theorem, and introduction to Lie groups. *Prereq. MTH 3400.*

MTH 3408 Representations of Finite Groups 4 QH

Characters, orthogonality relations, the regular representation. Semisimplicity, Maschke's theorem, Wedderburn's theorem, decomposition into matrix algebras. *Prereq. MTH 3104.*

MTH 3410 Algebraic Number Theory 4 QH

Rings of integers, Dedekind domains, factorization of ideals, ramification, the decomposition and inertia subgroups. Units in rings of integers, Minkowski's geometry of numbers, Dirichlet's unit theorem. Class groups, zeta functions, and density sets of primes. *Prereq. MTH 3321.*

MTH 3411 Differential Geometry 1 4 QH

Analyzes geometry of surfaces in the Euclidean space, with emphasis on the global aspects, using the technique of tensor calculus. Explores elements of Riemannian geometry, connections, and holonomy.

MTH 3412 Differential Geometry 2

Basic geometry for Riemannian manifolds, including connections, curvature tensors, geodesics, Jacobi fields, exponential maps, submanifolds, Morse index theorem, completeness, manifold with constant curvature, manifolds without conjugate points, manifolds with non-positive curvature.

MTH 3413 Topics in Differential Geometry 4 QH

Focuses on various advanced topics in differential geometry, the specific subject matter depending on the instructor and students. Possible topics include: symplectic geometry, Atiyah-Singer index theorem, mathematical aspects of general relativity, analysis and geometry on complex manifolds, geometric aspects of mathematical physics.

Prereq. MTH 3400

MTH 3420 Complex Manifolds 4 QH

An introduction to complex manifolds. The elementary local theory in several variables will be discussed, including Cauchy's integral formula, Hartog's extension theorem, the Weierstrass

preparation theorem and Riemann's extension theorem. The global theory includes the definition of complex manifolds, sheaf cohomology, line bundles and divisors, Kodaira's vanishing theorem, Kodaira's embedding theorem and Chow's theorem on complex subvarieties of projective space. Special examples of dimension one and two will illustrate the general theory. *Prereq. MTH 3400 and MTH 3103.*

MTH 3431 Probability 1 **4 QH**

Measure theory is not a prerequisite for this course. Some concepts from measure theory will be introduced as needed. This course will cover the following topics: sample space, probability measure, random variables, standard distributions such as the normal, exponential and Poisson, and modes of convergence, independence and dependence of variables, properties of expectation and conditional expectation, and characteristic functions.

MTH 3432 Probability 2 **4 QH**

This course covers topics in stochastic processes. Selected topics may include renewal theory, Markov chains and processes, martingales and Brownian motion. *Prereq. MTH 3431.*

MTH 3441 Statistics 1 **4 QH**

Introduces mathematic statistics, emphasizing asymptotics (large samples). Estimation, mean squared error, asymptotics of sample mean, sample median (via Taylor series), maximum likelihood estimation, consistency of MLE. Asymptotic distribution of MLE, Cramer-Rao bound, sufficiency and completeness. Rao-Blackwell theorem. *Prereq. MTH 3431.*

MTH 3443 Statistical Decision Theory **4 QH**

This course covers: statistics as a game, loss and utility, subjective probability, priors, Bayesian statistics, minimaxity, admissibility and complete classes, James-Stein estimators, Empirical-Bayes. *Prereq. MTH 3441.*

MTH 3444 Analysis of Variance **4 QH**

Discusses one-sample and two-sample tests; one-way ANOVA; factorial and nested designs; Cochran's theorem; regression; analysis of covariance; and simultaneous confidence intervals. *Prereq. MTH 3441.*

MTH 3445 Topics in Statistics **4 QH**

Focuses on various advanced topics in statistics, the specific subject matter depending on the interest of

the instructor and students. Possible topics include: multivariate statistics and clustering; biostatistics; Stein's paradox and admissibility, foundation; and probabilistic and inferential aspects of reliability theory. *Prereq. MTH 3441.*

MTH 3448 Nonparametric Methods in Statistics **4 QH**

Presents methods for analyzing the data that is not necessarily normal. Emphasizes comparing two treatments (the Wilcoxon test, Kolmogorov-Smirnov test), comparison of several treatments (the Kruskal-Wallis test), randomized complete blocks, tests of randomness and independence, and asymptotic methods (the 8 method, Pitman efficiency). *Prereq. MTH 3441.*

MTH 3450 Categorical Data Analysis **4 QH**

Focuses on the analysis of data in tables, that is, with cross-classified data. Includes loglinear models (a generalization of analysis of variance methods) and logistic regression. Includes homework problems involving real data and sometimes focusing on theoretical issues.

MTH 3452 Time Series **4 QH**

A standard course, including analysis of time series in the time domain, the frequency domain and the ARMA models.

MTH 3460 Pattern Recognition **4 QH**

Introduces the methods of pattern recognition: multivariate normal distribution, linear discriminant analysis, logistic regression, tree structured classification, cluster analysis, jackknifing and bootstrapping and cross-validation. This course is intended for students interested in computer science or applied statistics.

MTH 3481 Topology 3: Cohomology Theory **4 QH**

Studies homology with coefficients, cohomology groups, cup and cap products, the cohomology ring, Künneth theorem, spectral sequence of a fibration, duality in manifolds, and applications. *Prereq. MTH 3107.*

MTH 3483 Topics in Topology **4 QH**

Advanced topics in topology; the specific topics vary depending on the interests of the instructor and students.

MTH 3527 Enumeration **4 QH**

Introduces various counting techniques such as generating functions, recurrence relations, principle of inclusion-exclusion, Polya's theorem. Studies

various identities involving binomial and multinomial coefficients, Stirling numbers, Euler's numbers, Fibonacci numbers, etc.

MTH 3528 Coding Theory 4 QH
Includes algebraic coding, including cyclic codes, Reed-Solomon codes, BCH codes, and Reed-Muller codes. *Prereq.* MTH 3102.

MTH 3529 Graph Theory 4 QH
Examines graphs and subgraphs; trees; connectivity; Euler tours and Hamilton cycles; matchings, edge colorings; independent sets and cliques; vertex colorings; planar graphs; directed graphs; networks.

MTH 3530 Topics in Combinatorics 4 QH
Focuses on various advanced topics in combinatorics; the specific topics vary depending on the interests of the instructor and students. Includes topics such as advanced graph theory, combinatorial geometry, and algebraic combinatorics.

MTH 3531 Topics in Algebraic Geometry 4 QH
Focuses on various advanced topics in algebraic geometry, the specific subject matter depending on the interest of the instructor and students. Possible topics include: cohomology theory of algebraic schemes, study of singularities, geometric invariant theory, flag varieties and Schubert varieties.

MTH 3535 Complexity Theory 4 QH
Analyzes theory of relationships among complexity classes of algorithms. Covers sequential, deterministic, parallel, non-deterministic, and probabilistic models of computation, and Turing and decision tree models. Considers the class NP, and questions of completeness, especially NP-completeness, reducibility, and hierarchy of complexity classes. *Prereq.* MTH 3529.

MTH 3798 Master's Continuation 0 QH

MTH 3799 PhD Continuation 0 QH
The department offers an assortment of "Readings" and "Seminar" courses. A readings course is arranged between an individual student and individual instructor on a topic of their mutual choice. Seminars are arranged at organizational meetings held at the beginning of the quarter; the schedule and content are negotiated at these meetings. Directed study is also available.

MTH 3804 Readings in Combinatorics 4 QH
MTH 3806 Readings in Algebra 4 QH

MTH 3807 Seminar in Algebra 4 QH

MTH 3808 Readings in Algebraic Geometry 4QH

MTH 3811 Readings in Analysis 4 QH

MTH 3812 Seminar in Analysis 4 QH

MTH 3818 Seminar in Dynamical Systems 4 QH

MTH 3821 Readings in Topology 4 QH

MTH 3822 Seminar in Topology 4 QH

MTH 3824 Readings in Geometry 4 QH

MTH 3826 Readings in Statistics and Probability 4 QH

MTH 3827 Seminar in Statistics 4 QH

MTH 3836 Seminar in Combinatorics 4 QH

MTH 3849 Masters Thesis 4 QH

MTH 3850 Doctoral Dissertation 0 QH

Students may take graduate courses in the College of Computer Science as required electives with permission of the student's advisor.

Physics

I. Introductory Courses

PHY 3405 Thermodynamics & Kinetic Theory 3 QH
Includes first and second laws of thermodynamics; entropy and equilibrium; thermodynamic potentials;

elementary kinetic theory, statistical mechanics; and the statistical interpretation of entropy.

PHY 3414 Introduction to Solid State Physics 3 QH
Offers a semiclassical treatment of the thermal, magnetic, and electrical properties of crystalline solids. Includes X-ray diffraction and the reciprocal lattice; elasticity and lattice vibrations; specific heat; properties of insulators; magnetism in insulators and metals; and introduction to the band theory of metals. *Prereq. PHY 1303 and PHY 1432 or equiv.*

PHY 3415 Quantum Mechanics 1 3 QH
The first of a two-quarter sequence in quantum mechanics, focuses on observations of macroscopic and microscopic bodies, and the uncertainty principle—wave-particle duality; probability amplitudes; Schrodinger wave theory; and one-dimensional problems. *Prereq. PHY 1303 or equiv.*

PHY 3416 Quantum Mechanics 2 3 QH
Continues PHY 3415. Covers discrete and continuous states; Schrodinger equation in three dimensions; angular momentum; general theory of quantum mechanics; and applications. *Prereq. PHY 3415.*

PHY 3551, PHY 3552 Electronics for Scientists 1, 2 4 QH each
PHY 3551 and PHY 3552 form a two-quarter sequence covering electronic techniques for experimental research in many different fields of science. Topics include principles of semiconductor devices; analog techniques (amplification, feedback, integration), and digital techniques (counting, multiplexing, logic); design of electronic subsystems (analog-to-digital converters, phase-sensitive detectors, and data-logging systems); and understanding specifications of commercial electronic equipment. Lab examples make use of up-to-date integrated and discrete devices, such as are currently used in the electronic industry.

II. Elective Courses

PHY 3557 Graduate Advanced Laboratory 4 QH
Presents special projects in modern experimental physics, including electronic instrumentation used in measuring physical quantities and use of microprocessors. *Prereq. PHY 3551 and PHY 3552 or permission of instructor.*

PHY 3561 Graduate Project Laboratory 4 QH
Allows students to select and carry out individual projects involving instrumentation and computation. Involves the development of some aspect of instrumentation and/or computation in an ongoing research project, and the preparation of a final report. The student will be supervised by the project leader and the course instructor. Although the course carries 4 QH, it is taken in successive winter and spring quarters. *Prereq. Permission of instructor.*

III. Required Regular Courses (Offered Every Year)

PHY 3606 Computational Physics 3 QH
Studies FORTRAN, numerical analysis, and Monte Carlo methods. Topics include algebraic manipulation, minimization and maximization of functions, eigensystems, and types and uses of graphic displays in physics.

PHY 3607, PHY 3608, PHY 3609 3 QH each
Mathematical Methods and Classical Mechanics A, B, C
A three-quarter sequence dealing with mathematical methods of physics and classical mechanics. The two areas are intertwined with topics selected from the following areas. Mathematical methods covers differential equations, functions of a complex variable, linear vector spaces, Green's functions, calculus of variations, partial differential equations, integral equations, and introduction to group theory. Classical mechanics covers generalized coordinates, variational principles in classical mechanics, Lagrange's equations, Hamilton's equations, symmetry and conservation laws, central forces, classical scattering theory, small oscillations, continuous systems and classical fields, and theory of special relativity.

PHY 3611, PHY 3612, PHY 3613 3 QH each
Electromagnetic Theory A, B, C
Analyzes Maxwell's equations in the vacuum and special relativity. Discusses the energy-momentum tensor in the context of radiation problems, including bremsstrahlung and synchrotron radiation. Covers cavity radiation problems (such as microwave). Treats electromagnetic properties of matter for a variety of situations: conductors, dielectrics, ferromagnets, and superconductors. Studies electrostatic and magnetostatic boundary value problems. May cover other applications, such

as stopping power of matter for relativistic particles, plasma physics, and the interaction of electromagnetic radiation with gravity. *Prereq.* PHY 1403, PHY 3601 (concurrently).

PHY 3621, PHY 3622, PHY 3623 4 QH each
Quantum Theory A, B, C

Explores experimental basis of quantum theory, Schrodinger equation and probability interpretation of wave mechanics, uncertainty principle, application to one-dimensional problems, the harmonic oscillator, orbital angular momentum, and the central force problem. Studies quantum theory of scattering, born approximation, phase-shift analysis, introduction to S-matrix theory, general formulation quantum mechanics in Hilbert space, spin, identical particles and symmetrization principle, time-independent and time-dependent perturbation theory, semiclassical theory of radiation and atomic spectra addition of angular momentum, Wigner-Eckart theorem, quantum theory of radiation, and absorption, emission, and scattering of photons. *Prereq.* PHY 3415 or equiv.

PHY 3624 Advanced Quantum Theory 4 QH

Introduces the formulation of a relativistic quantum theory, study of the Dirac equation and its Lorentz covariance, plane-wave solution of the Dirac equation, and projection operators. Covers bound-state solutions of the Dirac equation in a Coulomb field and the hydrogen atom. Considers parity, charge conjugation, time-reversal symmetries, and propagator theory. *Prereq.* PHY 3623.

PHY 3631 Statistical Physics A 3 QH

Studies the phenomenological theory of thermodynamics, fundamental relations and thermodynamic potentials, extremal principles of thermodynamics, applications to simple systems, stability conditions, phase transitions, thermodynamics of electric and magnetic systems, and principles of irreversible thermodynamics. *Prereq.* PHY 3609 and PHY 3621 concurrently.

PHY 3632, PHY 3633 Statistical Physics B, C 3 QH each

Explores the principles of statistical mechanics and statistical thermodynamics; density matrix; theory of ensembles; derivation of the laws of thermodynamics; Fermi-Dirac and Bose-Einstein statistics, application to gases, liquids, and solids; theory of phase transitions; second-quantization formalism for interacting systems; and cooperative phenomena. *Prereq.* PHY 3621 and PHY 3631.

PHY 3641, PHY 3642 Solid State Physics 4 QH each
 Covers topics from Drude and Sommerfield (or free electron) models of electrons in metals, crystal structure, one-electron states in crystal lattices, Bloch's Theorem, semiconductors and semi-conducting devices, effects of electron-electron interactions, lattice vibrations and the classical and quantum theories of specific heat, optical properties of solids, investigation of crystal structure and excited states of crystals by X-ray and neutron scattering, simple transport theory based on the Boltzmann equation, and magnetic properties of solids.

PHY 3651, PHY 3652 Particle and Nuclear Physics 4 QH each

Includes nuclear scattering and reactions, classification of particle interactions, internal symmetries, field theory, unification of weak and electromagnetic interactions, and gauge theories. *Prereq.* PHY 3624.

IV. Advanced Elective Courses

PHY 3643, PHY 3644, PHY 3645 4 QH each
Advanced Solid State Physics A, B, C

Includes selected advanced topics in the theory of solids to be chosen each time by the interested students and instructor. Covers, for example, theory of normal metals, Hartree-Fock and Random phase approximations, optical and transport properties, solid state plasmas, Raman spectroscopy, quasiparticles and collective excitations, quantum solids, and amorphous solids. *Prereq.* PHY 3633, PHY 3623, and PHY 3642

PHY 3653, PHY 3654, PHY 3655 4 QH each
Fields, Particles, and Strings A, B, C

Introduces a local field theory. Considers symmetries of the Lagrangian and conservation laws; S-matrix and LSZ reduction formulae; perturbation theory, Feynman diagrams; spontaneous breaking and Higgs phenomenon; Glashow-Salam-Weinberg unified theory of electroweak interactions. Briefly introduces Einstein theory of general relativity. Discusses developments leading to string theory: normal mode expansion; open and closed strings; deduction of D=10 for bosonic and D=10 for superstrings; scattering amplitudes in strings; Heterotic String; compactifications on the torus, orbifolds and Calabi-Yau manifolds; 4-D strings; and superstring phenomenology.

PHY 3798 Master's Continuation	0 QH
PHY 3799 Doctoral Dissertation Continuation	0 QH
PHY 3811, PHY 3812, PHY 3813 Reading Course	1 QH each
PHY 3821, PHY 3822, PHY 3823 Reading Course	2 QH each
PHY 3831, PHY 3832, PHY3833 Reading Course	3 QH each
PHY 3841, PHY 3842, PHY 3843 Reading Course Offers reading course, or theoretical or experimental work under individual faculty supervision. <i>Prereq. Permission of instructor.</i>	4 QH each

PHY 3890 Master's Thesis 1 Student will start a master's thesis in a selected topic in experimental or theoretical physics. <i>Prereq. Permission of faculty member.</i>	4 QH
PHY 3891 Master's Thesis 2 Offers continuation and completion of master's thesis. Requires written thesis. <i>Prereq. At least a B grade in PHY 3890 and permission of faculty member.</i>	4 QH
PHY 3892 Master's Thesis 3 Offers continuation and completion of Master's thesis. Requires written thesis. <i>Prereq. At least a B grade in PHY 3891 and permission of faculty member.</i>	4 QH
PHY 3895 Doctoral Dissertation Offers experimental and theoretical work for PhD candidates	0 QH

Political Science

All courses carry three quarter-hours of credit unless otherwise specified. Most courses are seminars.

POL 3502 American Government and Politics
Analyzes the constitutional system and national government institutions focusing on the executive, legislative, and judicial branches. Examines political parties and pressure groups and their role in the policy process. MPA core course.

POL 3506 Politics and the Mass Media
Studies the role of mass media in the formation of public opinion, with special attention given to media usage in the electoral process.

POL 3508 American Legislative Process
Studies Congress and the influence of the President, administrative bureaucracy, parties, interest groups, and public opinion on the development of legislative policy. MPA elective.

POL 3512 American Constitutional Law
Employs excerpts of United States Supreme Court decisions and other primary legal materials to examine the constitutional rationale for judicial review; various philosophical approaches to the exercise of judicial power; and the scope of judicial authority to settle questions challenging the

legitimacy of governmental actions in the American constitutional system.

POL 3516 The Presidency
Analyzes the development of constitutional and extra-constitutional presidential power, examining the role of the president in formulating and executing domestic and foreign policy.

POL 3518 American Electoral Behavior
Considers the theoretical and methodological assumptions of election studies of the American political system and reviews the substantive conclusions.

POL 3519 Campaigns and Elections
Studies campaign tactics and strategies. Fieldwork required.

POL 3520 The Judiciary
Studies the judicial process in the United States, emphasizing federal courts. Focuses on theories and empirical research regarding judicial decision-making, how and why judges decide what they do, and with what political effects.

POL 3521 Comparative Political Parties

This course will examine the critical linkage function of political parties and elections in democratic societies. The course will include materials on political parties in the United States and, in comparative perspective, other nations both in advanced democratic societies such as the United States and Western Europe and in emerging democratic nations. The focus will be on the organization, coalitional nature, activities, and policy-making impact of these agencies in furthering democratic ends. The influence of comparative electoral arrangements and systems in shaping nature and quality of political representation will also be analyzed.

POL 3522 Political Parties

Focuses on American political parties, including such aspects as organization, nominations and party reform, elections, voting behavior, and state and national political trends.

POL 3523 Interest Groups

Surveys the role of interest groups in American politics, with emphasis on distinctions between traditional economic interests, newer types of social forces, and public interest organizations.

POL 3524 Civil Rights

Examines the doctrine of constitutionalism, illustrated and amplified by a study of the substance and process of the Bill of Rights as developed in decisions of federal courts, and congressional enactments.

POL 3526 Procedural Due Process

Examines the United States Supreme Court's treatment of the doctrine "due process of law." Focuses on the nationalization of the Bill of Rights and the constitutional guarantees of process in administrative settings.

POL 3527 Comparative Civil Liberties

This course examines several problems of American civil liberties in comparison with constitutional developments in other advanced democracies. Selected cases from German's Constitutional Court, Canada's Supreme Court and the European Court of Human Rights, dealing with freedom of speech, freedom of the press, freedom of conscience, equal protection, and social/economic rights, comprise the main reading of the course.

POL 3528 Environmental Politics Seminar

Seminar explores the debates surrounding the making of environmental policy in the United

States and other nations. Examines the nature of environmental problems, how the structures of political systems affect policymaking, and the competing interests at work in environmental politics. Also discusses environmental policy in crossnational and international perspectives.

POL 3529 Democratization and Governance

This course explores the post-Cold War democratic challenge to authoritarian, military, one-party, and dictatorial regimes throughout the Third World. It examines criteria for assessing the strength and success of democratization and the methods of foreign donors to promote it. It also examines the linkage between democracy and development. Development Administration concentration elective. MPA elective.

POL 3530 Democratization: Basic Approaches

This course will examine the fundamental questions and the basic thinking that has guided approaches to the study of democratic development. The major focus will be on the works of such influential thinkers as Lucien Pye, Samuel Huntington, Guillermo O'Donnell, S.M. Lipset, Alfred Stepan, Robert Bates, Joseph LaPalombara, and others whose work set the parameters for study in institution building and political representation in emerging democratic societies.

POL 3531 Seminar in Comparative Politics

Examines various approaches to the study of comparative politics. Focuses on the dominant models and theories while analyzing states and their structures, state-society interactions, and political culture. MA Comparative Government and Politics concentration requirement.

POL 3532 Comparative Democracies

This course deals with the recent approaches to studying and understanding democratic political development in selected areas of the world. Attention will be given to Africa, Latin America, Eastern Europe and Asia in differing degrees in various years and depending on on-going developments. The course will focus on the current research on institution-building, including legislative assemblies, political parties and elections, and the democratic values of elites and masses, among other things as they impact on the process of democratic representation.

POL 3533 Crisis and Change in Eastern Europe

Analyzes the decommunization and desatellitization of former Soviet Bloc countries and the prospects

for stable political development and successful economic growth in the post-communist era. Considers briefly crisis and change in Yugoslavia and Albania.

POL 3534 Comparative Political Economy

This course compares national economic policies—in areas such as banking regulation, taxes, welfare, environmental protection, and privatization—in up to five countries each quarter. We examine the impacts of (a) the type of political system (presidential democracy, parliamentary democracy, modernizing military regime, and so on) and (b) the organization of the central government bureaucracy on (c) public policy choices. Countries covered will include both advanced industrial nations (such as the U.S., Britain, Japan, France, or Germany) and developing countries (such as Mexico, Brazil, South Korea, or India).

POL 3535 Parliamentary Democracy in Western Europe

Compares environment, vehicles of popular participation, and formal structures and reach of government in the parliamentary democracies of western Europe. Gives special attention to England, France, and Germany.

POL 3537 Political Development in Russia and Other Former Soviet Republics

Examines the roots and causes of the collapse of communism in the former Soviet republics and their political development in the current post-communist era. Focuses on efforts to develop democratic government, a free market economy, and inter-ethnic peace and harmony in heterogeneous societies. Gives attention also to inter-republic relations and the prospect of success for the new Commonwealth of Independent States.

POL 3545 Government and Politics of the Middle East

Examines the political and economic structures of the Arab states and Israel as well as inter-Arab politics and inter-state conflict in the area.

POL 3551 Seminar in International Relations

Analyzes the major actors, their goals, and the means and strategies they utilize within the international system. MA International Relations concentration requirement.

POL 3552 International Political Economy

This course contrasts two approaches to understanding trade, financial, and other economic

relations among nation-states. The first, international relations theory, emphasizes the relative power positions of states in a fundamentally anarchic and unequal international system. The second, neoclassical economics, assumes peace and security, and stresses market relations of supply and demand among both states and private firms. We employ these alternative prisms to examine historical and contemporary issues, which may include: the Bretton Woods Agreement, the behavior of the euromarkets, the North American Free Trade Agreement, and the possibilities for collective action to reduce environmental degradation or the for-profit trade in arms or drugs.

POL 3555 International Organization

Focuses on issues of international political economy. Emphasizes the role of various international organizations in managing economic interdependence and the role of international administrators in the United Nations' search for a new international economic order. Discusses nongovernmental organizations, such as multinational corporations.

POL 3558 Asia and the Politics of Development

Relates the theoretical literature on political development to the concrete attempts to develop in Asia. Encourages each student to concentrate on one state and explore different ideas about political development as they relate to that state because of the diversity in levels and types of political development in Asian states. MPA elective.

POL 3559 Government and Politics of Latin America

Investigates contemporary Latin American politics, emphasizing formal political institutions, such as electoral rules, and informal political process, such as patron-client networks, under alternate national political "games," including traditional authoritarianism, populism, modernizing military rule, the post-revolutionary regime, and elite or mass democracy. Focuses on Mexico, Cuba, and the larger countries of South America.

POL 3560 Politics of the Developing Nations

Considers the process of political development in the third world, including both internal and international issues such as leadership patterns, the role of the military and political parties, and underlying economic and social factors. Development Administration concentration requirement. MPA elective.

POL 3562 United States Relations with Russia and Other Former Soviet Republics

A study of American policy toward Russia and the other former Soviet republics in the post-communist era. Focuses on how the United States is fostering political and economic democracy and protecting its strategic interests in the large Eurasian landmass that once made up the Soviet Union.

POL 3563 United States-Far East Relations

Analyzes American diplomacy in the Far East, with primary concentration on relations since World War II with Japan, China, and Southeast Asia.

POL 3564 China's Foreign Policy

Examines major principles in China's foreign relations. Explores how socialist ideology, domestic politics, nationalism, and the need to participate in the international economic system for the purpose of trade, investment, and technology transfer affect China's foreign policy. Examines China's role in the United Nations, and its relations with Taiwan and Hong Kong.

POL 3565 Central and Eastern Europe In World Affairs

Reviews the origins, character, and impact of satellization by the Soviet Union after World War II; analyzes the roots and causes of the collapse of Soviet power in the region in 1989 and 1990; and examines the region's strategic, economic, and diplomatic interests in the current post-communist era. Gives special attention to the region's relations with Russia, Germany, France, and the United States.

POL 3566 Chinese Politics

Examines the impact of ideology, development, and culture on the major issues in Chinese politics since the Communist Party took control in 1949. Issues include leadership recruitment and succession, economic development, class and class struggle, political culture, education, socialist democracy, socialist legality, and the evolving definition of socialism in the context of Chinese culture.

POL 3567 Japanese Politics and Foreign Policy

Examines the development of Japan's political system since World War II. Focuses on Japan's institutions and democratic practices in the context of political culture. Explores the interrelationship between business and government, Japan's foreign policy and international trade practices, and business practices and organization. Raises issues concerning Japan's extraordinary economic success

and Japan's limitations as a model for other countries.

POL 3568 Sub-Saharan African Politics

Compares the political systems and foreign policies of selected African states south of the Sahara.

POL 3570 United States Foreign Policy

Examines in depth selected issues concerning the role of the United States in world affairs since 1945.

POL 3571 Ethnic Political Violence

Analyzes ethnic political violence from an international perspective. Undertakes in-depth analysis of the key international examples. Focuses upon causes of ethnic political violence as well as potential remedies.

POL 3574 United States National Security Policy

Deals with United States national security policy in the post-World War II era. Focuses on the evolution of United States strategic doctrine, including nuclear and conventional strategy, and arms control efforts. Relates security policy to pursuit of political goals.

POL 3576 War in International Perspective

Analyzes the causes of war as well as policies for the prevention of war. Considers the changing technologies and strategies of war from both a historical and contemporary perspective. Considers specific past and present wars from an international perspective, and assesses mechanisms for preventing wars.

POL 3575 Arab-Israeli Dispute

The Arab-Israeli confrontation has its own dynamics and a character that has changed through the decades. Students analyze the conflict's interaction with the internal politics of the Arab states and Israel, pan-Arab politics, and the role of the great powers in the region.

POL 3578 Foreign Policy of Commonwealth of Independent States (formerly USSR)

Studies CIS foreign policy since 1964. Discusses relations with the United States, East and West Europe, the Middle East, Africa, China, IMF and international institutions.

POL 3583 International Law

Investigates the development of legal principles and norms in relation to the international political

system, particularly focusing on the role and interpretation of law within the United Nations and World Court contexts. Examines issues such as sovereignty and international jurisdiction, treaty interpretation, the peaceful resolution of disputes, and the use of UN peacekeeping forces.

POL 3584 European Organizations

Examines the historical development and modern political context of the major post-1945 European organizations, focusing primarily on the European Community. Discusses factors affecting the movement toward economic and political integration in Europe and the evolution of Europe as an international actor.

POL 3586 Nationalism

Studies the evolution and role of nationalism in both theory and practice. Analyzes representative nationalistic movements and theories.

POL 3587 Politics of Revolution and Change

Analyzes the nature of political change with attention to both theory and practice. Discusses revolution, major trends in contemporary politics, and the relationship between political change and technological, scientific, or social change.

POL 3589 Terrorism, Violence, and Politics

Analyzes the theory and practice of terror, violence, coercion, force, and threats in political life.

POL 3591 Totalitarianism and After

Analyzes totalitarianism and dictatorship, including study of historical background, fundamental characteristics; theories of origin, nature, and significance; and evaluation of techniques,

POL 3593 Ancient and Medieval Political Thought

Focuses on the development of political thought from Greek antiquity to the end of the Middle Ages, utilizing both historical and analytical approaches. Considers the cultural, social, and intellectual context within which political theories develop. MA Political Theory concentration requirement.

POL 3594 Modern Political Thought

Examines political thought from Machiavelli to Marx.

POL 3595 Contemporary Political Theory

Explores the main currents of political thought in the latter half of the nineteenth and the twentieth centuries with special emphasis on the relations

between political theory, philosophy, and political science.

POL 3596 Marxism

Examines the theory and practice of Marxism, including its background and origins, and its subsequent development.

POL 3597 Trends in American Political Thought

Examines intellectual concepts and movements that have informed and influenced American political life, with emphasis upon those relating to the making and execution of public policy. MPA elective.

POL 3600 Introduction to Public Administration

Introduces literature and the major topics in public administration with special attention given to the interrelationships of politics and administration. MPA core course. MA Public Administration concentration requirement.

POL 3601 Public Personnel Administration

Introduces students to the public personnel function from a managerial standpoint. Addresses methods of constructive leadership of government personnel, leadership that encourages a more competent, motivated, and representative, public administrative workforce. Employs case studies and films, along with assigned readings. MPA core course.

POL 3602 Organization Theory and Management

Examines the general principles underlying organizational structures and processes. Topics include models and ideal types, open systems theories, organizational technologies, decision making, and organizational development and change. MPA core course.

POL 3603 Public Budgeting

Surveys governmental budgeting at the federal, state and local levels. Surveys major revenue sources and expenditure responsibilities. Discusses budgetary processes and politics, as well as resulting policies. Considers both proposed and implemented reforms. MPA core course.

POL 3604 Techniques of Policy Analysis

Provides a systematic approach to understanding the origins, formulation, implementation, and impact of government. Reviews key analytical concepts and competing theoretical perspectives.

Considers both the political dimensions of public policymaking and the technical aspects of program design within the natural history of the policy-making process. Draws on case materials from a spectrum of policy areas. MPA core course.

POL 3605 Quantitative Techniques 1

Introduces quantitative methods. Emphasizes descriptive statistics, inference, and cross-tabulation analysis. Includes initial uses for computers and programming techniques. MPA core course.

POL 3606 Quantitative Techniques 2

Presents quantitative methods, emphasizing techniques and applications of value to public sector analysts. Includes hypothesis testing, bivariate regression and correlation, and multiple regression. Examines how to generate and interpret statistical analyses through use of the SPSS program. MPA core course. *Prereq.* POL 3605.

POL 3607 Computer Applications

Introduces the basics of computer applications for public administrators, concentrating on the use of personal computers. Topics include spreadsheets, graphics, database management, management information systems, and word processing. MPA core course.

POL 3608 Public and Nonprofit Financial Management

Introduces financial management practices. Considers theoretical questions of how to define public interest and what constitutes a legitimate public expenditure. Explores topics such as cash management, risk management, fund accounting, debt financing, endowment spending and control, cost allocation procedures, and tax expenditures. MPA core course.

POL 3610 Methods of Economic Analysis for Public Administrators

Introduces a construct of public economy as a means for focusing on contemporary economic issues facing public administrators. Serves as a prerequisite for students lacking economic course work at the baccalaureate level. MPA core course.

POL 3611 Intergovernmental Relations

Offers an institutional-behavioral analysis of the changing relationship among the various levels of American government—national, state, and local—relating the pattern of change to the social and economic forces that underlie it. MPA elective.

POL 3614 Administrative Ethics in Public Management

Analyzes ethical problems in American public administration including discussion of ethical dilemmas frequently faced by public managers. MPA elective.

POL 3615 Development Administration

Takes a “manager’s-eye view” of the formulation, implementation, evaluation and improvement of development projects in less developed countries. Includes integrated rural development, community participation, lower- and middle-level management decentralization, and management training. Development Administration concentration requirement. MPA elective.

POL 3616 State Government

Appraises the problems of contemporary state government in the United States. Emphasizes the state government of Massachusetts. Stresses individual research. MPA elective.

POL 3622 Urban Government

Explores problems in urban government such as political independence, government finance and administration, rapid growth of suburban and metropolitan areas, and decline and decay of the core city. Emphasizes the Boston metropolitan area. Stresses individual research. MPA elective.

POL 3625 Collective Bargaining and Labor Relations in the Public Sector

Studies labor relations in public enterprises, with special emphasis on the role of public employee unions and collective bargaining. Emphasizes labor relations in the public sector (including employee rights and legal issues) and the history, theory, techniques, and impacts of public employee unionism and collective bargaining. MPA elective.

POL 3630 Health Administration

Introduces administration in hospitals and other health care organizations. Topics include financial management, quality and utilization control, strategic planning, marketing, personnel management, and information systems. Health Administration and Policy concentration requirement. MPA elective.

POL 3633 Institutional Leadership and The Public Manager

Examines the problems and techniques relevant to management of a public agency, with an emphasis on issues in the external environment of the

organization. Topics include legislative relations; media relations; role of the courts; community and union relations; policy implementation and evaluation; and ethics and corruption. *MPA elective.*

POL 3634 Functions and Techniques of Public Management

Examines the problems and techniques relevant to management of a public agency, with an emphasis on internal issues that face public managers. Topics include planning and agenda setting; organizational design; agency budgeting; employee recruitment, selection and development; and reporting, monitoring and evaluation. *M.P.A. elective.*

POL 3637 Comparative Public Administration

Examines issues related to bureaucracy and organization, budgeting, public management, and personnel administration in a cross-national, cross-cultural, and international context. Uses examples from Africa, Asia and Latin America as well as the U.S. and Europe. *MPA elective.*

POL 3641 Techniques of Program Evaluation

Reviews methodologies for assessing the impact of public policy. Includes experimental and quasi-experimental research design, the value and limits of case studies, political and organizational barriers to evaluation research, report writing, and procedures for instituting change. *MPA elective.*
Prereq. POL 3605.

POL 3643 Organizational Psychology and Behavior

Examines the literature, theories, and concepts of administrative behavior as it has evolved with emphasis on the development of self-awareness and the building of interpersonal skills. *MPA elective.*

POL 3645 Program Implementation

Examines the implementation of policy, including the intergovernmental fiscal context, implementation capacity, the politics of implementation, and public-private and interbureaucratic coordination issues. *MPA elective.*

POL 3648 Legal Topics for Health Administration

Provides an overview of legal issues and the topics relevant to health administration, including malpractice, accreditation, and affiliations. *Health*

Administration and Policy concentration requirement. MPA elective.

POL 3655 Politics and Administration in Cities and Towns

Examines the political and administrative structures that influence the conduct of city and town governments. Emphasizes dynamic relationships between these structures and the implications for public policy making. *MPA elective.*

POL 3656 Business/Government Relations

Extensively examines the relationship between the United States government and the private economy from an historical and a contemporary perspective. Analyzes a number of public policy areas in which public and private actors interact. Examines stabilization policy, regulation, antitrust, and social welfare policy in the context of alternative interpretations of the United States political economy. *MPA elective.*

POL 3658 State Budgeting

Explores state budget development and execution. Discusses relevant political actors, processes, and policies relating to state revenue and expenditure decisions. Analyzes state budgeting in a federal system and in a comparative context. *MPA elective.*

POL 3659 Municipal Finance

Discusses the special problems of budgeting and finance in local governments, including budget preparation and presentation, debt management, capital financing, and local taxation policy. *MPA elective.*

POL 3660 Development Planning

Focuses on the dynamics and activities of host-government, bilateral, and multilateral organizations as they analyze and tackle such problem areas as agriculture, education, health, population, and land reform in developing countries. Stresses the special role of public administration in less developed countries. Development Administration concentration requirement. *MPA elective.*

POL 3666 Housing Policy and Administration

This course surveys the housing problems associated with the poor, the elderly, and middle-class citizens. It studies housing policies which have been enacted on the national and local levels and assesses the impact of these policies.

POL 3667 Equal Opportunity in Public Administration

Examines barriers to EEO; helps students develop an awareness of issues surrounding the Affirmative Action Program and particularly some of the historical perspectives of discrimination against minorities and women; and offers instruction in techniques for developing a meaningful equal opportunity program for public organizations. MPA elective.

POL 3670 Public Relations in Public Administration

Focuses on evaluating the public manager's role in the process of communication with the public. Evaluates issues of imagery and accountability as well as current topics. MPA elective.

POL 3674 Intergovernmental Fiscal Relations in the United States

Explores the relationships between the local and state levels of government in the assessment and collection of taxes, budgeting, debt management, and state aid. Evaluates the federal role and fiscal intergovernmental relations. MPA elective.

POL 3675 Health Policy and Politics

Introduces contemporary health care policies, programs, and politics. Discusses the current crisis in health care costs, with proposed solutions such as health planning, certificate-of-need regulation, and different health insurance reimbursement mechanisms. Health Administration and Policy concentration requirement. MPA elective.

POL 3679 Contemporary Issues in Third World Development

Examines the major themes in development studies today. Explores approaches to the development and modernization, dependency theory, food aid and production, population growth, equity and poverty, rural and urban development, health and nutrition, education, and the international context of development assistance. Students considering a development administration concentration should try to take this course as their first in the field of development. Development Administration concentration requirement. MPA elective.

POL 3690 Topical Seminar 1

Examines current issues in the area of Public Administration.

POL 3691 Topical Seminar 2

Examines current issues in the area of American Government and Politics.

POL 3692 Topical Seminar 3

Examines current issues in the area of International Relations.

POL 3693 Topical Seminar 4

Examines current issues in the area of Comparative Government and Politics.

POL 3694 Topical Seminar 5

Examines current issues in the area of Political Theory.

POL 3696 Issues in Public Finance

Examines current issues in public-sector finance. Emphasizes policy alternatives and political realities.

POL 3699 Seminar in State and Urban Administration

Analyzes specified topics and issues in state and urban administration with the purpose of presenting material of current interest and allowing in-depth research into specified areas where appropriate. Subject matter to be covered is described in registration materials. MPA elective.

POL 3798 Master's Continuation

0 QH

POL 3886 Directed Study

Offers assign reading under the supervision of a faculty member.

POL 3891 Internship

Offers work experience (at least 15 hours per week) that includes planning, research, policy development, and other administrative aspects in a government or nonprofit organization.

POL 3892 Internship Readings and Analysis 6 QH

Offers study directly related to an internship assignment.

POL 3895 Thesis

6 QH

Offers thesis supervision by individual members of the department.

Psychology

All courses carry three quarter-hours of credit unless otherwise specified.

PSY 3013 Learning, PSY 3014 Neuropsychology 1, PSY 3015 Neuropsychology 2, PSY 3016 Language, PSY 3017 Cognition, PSY 3018 Perception, PSY 3019 Sensation, PSY 3020 Personality, PSY 3021 Social Psychology Proseminar

Serves as first-level graduate courses. Includes faculty lectures, student presentations, and discussions of important theoretical, experimental, and methodological approaches to the understanding and explanation of behavior and the mental processes underlying behavior. Emphasizes language and cognition; learning, motivation and behavior analysis; behavioral neuroscience; sensation and perception; and social/personality.

**PSY 3111, PSY 3211, PSY 3311
Quantitative Methods 1, 2, 3**

Surveys the quantitative methods used in experimental psychology, emphasizing applications of computer programming, probability, set theory, analysis of variance, effect size, reliability, statistical power and planned contrasts.

PSY 3153 Seminar in Comparative Psychology
Focuses on studies of interspecies differences and similarities used in investigating several research topics: intelligence and learning, social communication, social development, and comparative cognition/cognitive ethology. Requires a brief field study using traditional ethological recording techniques (at the Franklin Park Zoo or the Fens) which will be presented to the class.

PSY 3191 Heredity and Society

Critically examines behavior-genetic research, its social-historical setting, methods, and substantive conclusions. Begins with research on the genetics of intelligence and continues on to the genetics of psychopathology and, depending on class interest, such areas as criminality, alcoholism and obesity.

PSY 3193 Ethics in Research Psychology
This course addresses ethical concerns and

dilemmas that psychology students and professional research psychologists face in acquiring and using scientific knowledge.

PSY 3449 Current Issues in Experimental Psychology

Discusses current theoretical and methodological issues in selected areas of experimental psychology.

Experimental Personality and Social Psychology

**PSY 3171, PSY 3271
Psychopathology 1, 2**

4 QH

Considers the major forms of psychopathology in terms of their symptoms and diagnoses, their etiology, and their therapy. Additional topics may include the historical development of psychopathological concepts, the case study method, and hypnosis.

PSY 3172 Abnormal Psychology

Considers the symptomatology and etiology of the major forms of psychopathology in detail. Includes anxiety disorders, somatoform and dissociated disorders, schizophrenia, mood disorders, borderline disorders, and sociopathy.

**PSY 3371, PSY 3372, PSY 3373
Social Psychology 1, 2, 3**

Surveys theory and research in social psychology. Covers attitude and attitude change, aggression, altruism, group processes, social cognition, and nonverbal behavior.

PSY 3477, 3577

Personality Theory and Research 1, 2
Surveys theory and research in personality psychology. Topics include assessment and research methods, personality development, processes and structure, and psychological functioning and well-being.

Language and Cognition

PSY 3161 Cognition

This course addresses current theoretical and empirical issues in cognition. Specific topics vary from quarter to quarter.

PSY 3166 Psycholinguistics

Addresses current theoretical and empirical issues in psycholinguistics. Specific topics vary from quarter to quarter.

Sensation and Perception

PSY 3188, PSY 3288 Vision 1, 2

Advanced coverage of visual psychophysics and physiology. Spatial, temporal, and chromatic factors affecting visual sensitivity are emphasized.

PSY 3289 Perception

Contemporary theoretical and empirical issues in perception are covered. Specific topics vary.

Psychobiology

PSY 3151 Brain and Behavior 1

Introduces basic methods of physiological psychology, including animal surgery, electrical stimulation of the brain, electrophysiological recording, and histological techniques. Presents the opportunity to gain experience in these methods by carrying out a limited research project during the semester. Enrollment limited to ten. *Prereq.*

Admission to doctoral candidacy or permission of instructor.

PSY 3159 Neurochemistry and Behavior

Examines different experimental approaches to the problems involved in uncovering the relationships between changes in brain activity and changes in behavior produced by drugs. Discusses current theorizing on the role of early experience, environmental factors, biological rhythms, and other facets in the determination of drug-induced behavior changes.

PSY 3225 Biological Bases of Mental Retardation

Considers the relationship between biological malfunction of the brain in particular, and the defective learning ability and other behavioral abnormalities which constitute mental retardation. Aims toward as comprehensive a survey as time

permits. Includes actual case presentations as illustrative examples.

PSY 3265 Human Functional Neuroanatomy

Studies the neuroanatomy of the human brain through the direct inspection of human brain tissue in a laboratory style format. Considers functional considerations as a consequence of anatomical structure. Requires considerable independent study with the specimens and text. Requires students to be responsible for memorizing anatomical details as well as understand broad principles of brain organization, development, and action. Also presents clinical manifestations of brain damage.

PSY 3295 Special Topics in Behavioral Neuroscience

In recent times considerable published work has appeared on the topic of computation in both model and real neuronal networks. The fundamental (and old) idea is to understand brain function by examining how its elements perform calculations. This seminar is intended to introduce students in the behavioral sciences to selected topics in computational neuroscience. Topics will be selected on the criteria of recent publication in an area of sustained advancement and will include computation models in vision, audition, the control of movement, and learning. To maintain the introductory spirit, the seminar will begin with a tutorial on the physiology of neurons, synaptic transmission, and computation in simple nerve nets (two and three elements).

Special Topics

PSY 3291 Research Laboratory 1 QH

Allows students and faculty advisors to discuss lab projects, current literature, theory, and applications.

PSY 3292 Research Project 3 QH

Permits intensive interaction and discussion between students and faculty advisors on contemporary research literature, theory, applications, and lab projects.

PSY 3798 Master's Continuation 0 QH

Offers continuation of experimental work for the master's degree requirement.

PSY 3799 Doctoral Dissertation Continuation 0 QH

Offers continuation of experimental and theoretical work for PhD candidates.

PSY 3891 Thesis **2 QH**

Offers experimental work for the master's degree requirement.

PSY 3894 Dissertation **0 QH**

Offers experimental and theoretical work for Ph.D. candidates.

Interdisciplinary Courses

INT 3225 Foundations of Neural Science

Introduces some of the fundamental problems and principles of neuroscience, emphasizing its multidisciplinary nature. Topics include nerve cell biology, nerve cell chemistry, central nervous system chemistry and disorders, visual perception's neural basis, developmental changes in nervous

system tissue and the neurobiology of motivated behaviors. Introduces the nervous system and how it may be studied, indicating the neuroscience resources available at Northeastern University. Includes lectures by specialists in each of these areas.

INT 3226 Topics in Neural Science

Offers lectures by specialists on the central concepts, themes, and commonly used methodologies in neuroscience. Presents practical and theoretical aspects of neuroscience. Draws topics from current Society of Neuroscience Meeting Programs based on guest speakers' availability.

Sociology and Anthropology

All courses carry three quarter-hours of credit unless otherwise specified

Social Anthropology

SOA 3100 Culture Theory **4 QH**

Analyzes the emergence and growth of the major theoretical orientations in contemporary cultural studies: functionalism, structuralism, Marxism, post-structuralism, and post-modernism. Examines each theory through primary sources in the various traditions. Discusses theories as they relate to the practice of anthropology and cultural studies in general, and to the social context of the researchers' own culture.

SOA 3102 Class and State Formation **4 QH**

Compares the development of social, political, and economic stratification in some societies and the maintenance of unstratified relations in others. Critically evaluates theories about why and under what conditions societies become stratified. Examines the emergence of classes and state structures in historical and contemporary cases.

SOA 3120 Camera on Culture: Visual Anthropology

Explores how cultures are portrayed on film and examines anthropologists' use of film to gather information and represent other peoples. Discusses how postcolonial societies' filmmakers have addressed their own cultures, the experience of colonialism, and the nature of filmmaking and

film/video consumption in the third world. When possible, includes lab film production.

SOA 3123 Field Work 1 **4 QH**

Studies data collection through participant observation and related anthropological methods. Includes data analysis and reports.

SOA 3124 Field Work 2 **4 QH**

Studies data collection through participant observation and related anthropological methods. Includes data analysis and reports.

SOA 3145 Peasants

Examines the institutions of peasant society. Investigates the structure of traditional civilizations and the relations between urban and local communities: comparative and functional analysis of the peasant community and the dynamics of change from peasant to postpeasant and industrialized societies.

SOA 3155 Individual and Culture

Examines current theory and method in the study of the interplay between personality and culture. Discusses contributions by various disciplines.

SOA 3156 Gender, Kinship, & Social Change **4 QH**

Focuses on debates surrounding the origin of the gender division of labor and the family. Examines

gender relations and kinship dynamics, including family forms in political and economic context, using examples of egalitarian, ranked, stratified, and state-level societies. Analyzes social stratification, colonialism, and capitalist development in relation to changing gender roles, ideologies, and critically evaluates theories of the emergence of gender hierarchy.

SOA 3220 Culture and Mental Illness

Discusses and analyzes the nature and meaning of culture, the role of culture in personality formation, culture and anxiety, and anthropological approaches to the normal and the "abnormal". Explores the question, "is mental illness psychological fact or cultural fiction?"

SOA 3303 Gender, Sexuality, and Culture

The course examines the construction of sexuality in western social sciences, its deconstruction by critics, and differential communities. Because the greatest challenges to western social scientific constructions of sexuality come from the margins of the dominant culture, the course will pay close attention to nonheterosexual and non-western formulations of identity, experience, and lifestyle. The work of Freud, Ellis, Kinsey, Margaret Mead, Levi-Strauss, and Foucault, feminist theorists, and others will be critically read; the focus will be on the experiences of people of color in the United States and in a range of other countries.

SOA 3355 Anthropology of Law and Conflict

Topics include settling disputes in stateless societies; forms and mechanisms of social control; law as an indicator of cultural and social norms; and the study of conflict resolution as an ethnographic tool. Requires some field research and analysis.

SOA 3360 Economic Anthropology

Focuses on debates about the nature of production, distribution, and exchange in precapitalist (communal and peasant) societies. Analyzes transformations of indigenous property relations, savings and credit arrangements with capitalist colonialism and post-colonial development, and examines the uneven transition from subsistence to market economies.

SOA 3425 Tribal Societies and Culture

Examines the problems faced by today's tribal peoples and national minorities. Using cross-cultural case studies, students analyze the

relationship of governmental policies and economic development priorities to the survival of self-identified tribal cultures and minority populations throughout the world. Addressing questions of human rights, nationalism, cultural autonomy and resistance, and self-determination.

SOA 3440 Latin American Society and Development

Explores the process of social, economic, and cultural change in Latin America. Focusing on the present, traces class formation, agrarian structures, ethnic identity, ceremonial organization, gender roles, and political conflict since the colonial era in a range of Latin American countries. Stresses the relationship between communities and national, political, and economic systems. Focus over the years will alternate between Central America and Mexico and South America.

SOA 3441, SOA 3442, SOA 3443,

SOA 3444 Ethnographic Studies 3 QH each

These area studies courses are offered as the department's resources permit. Topics include Latin America, the Caribbean, Africa, China/East Asia, India/South Asia, Southeast Asia, the Mediterranean, and Eastern Europe.

SOA 3600 Seminar

3 QH

Discusses selected topics in the field of anthropology.

SOA 3798 Master's Continuation

0 QH

SOA 3800, SOA 3801, SOA 3802 3 QH each

Directed Study in Social Anthropology

Comprises reading and empirical research in social and cultural anthropology supervised by members of the anthropological staff.

SOA 3810 Master's Paper in Social Anthropology

Comprises empirical or library research meeting the criteria for publication in a professional journal. Supervised by members of the department.

Sociology

SOC 3100 Foundations of Social Theory 1 4 QH

Studies the classic theorists including Durkheim, Weber, Marx, and others.

SOC 3101 Foundations of Social Theory 2 4 QH

Analyzes modern theorists from the 1930s onward (Parsons, Merton, Levi-Strauss, Goffman, Homans,

Schutz, Garfinkel, Ricoeur, Lukacs, Habermas, and others). Stresses the social and historical context of theory construction.

SOC 3113 Introduction to Research

Methods

2 QH

Introduces methods of social research including field study and participant observation techniques, survey techniques, interviewing and questionnaire construction, sampling procedures, experimental design, content analysis, and uses of available data. Open only to Law, Policy and Society students.

SOC 3114 Introduction to Quantitative

Research Methods

2 QH

Introduces quantitative techniques of analysis. Students are expected to conduct individual research projects. Open only to Law, Policy and Society students. *Prereq.* SOC 3113 or equiv.

SOC 3115 Introduction to Statistical Analysis in Sociology

4 QH

Introduces statistical methods relevant to sociology. Topics include tabular analysis, nonparametric statistics, analysis of variance, regression analysis, path analysis, measures of association, estimation, and univariate and multivariate hypothesis testing. A knowledge of elementary statistical theory is presumed.

SOC 3116 Introduction to Research

Methods

4 QH

Surveys methods of social research including field study and participant observation techniques, survey techniques, interviewing and questionnaire construction, sampling procedures, experimental design, content analysis, and use of available data.

SOC 3117 Quantitative Research Methods

4 QH

Presents quantitative techniques of analysis. Students are expected to conduct individual research projects. *Prereq.* SOC 3116 or equiv. or permission of instructor.

SOC 3120, SOC 3121 Seminar in Qualitative Analysis 1, 2

4 QH each

Studies qualitative techniques of analysis. Examines social-structure process and meaning in interacting groups. Students study a face-to-face group by means of participant observation using symbolic interaction concepts. Not offered in years in which SOA 3121 and SOA 3122 are offered.

SOC 3128 Capitalism, Nature and Socialism

Analyzes the political economy of international capitalism, really existing state socialism, and the global environment. Topics of theoretical focus include philosophies of nature; laws of capital accumulation and ecological degradation; technology and the division of labor; combined and uneven development, imperialism, and ecological crises in the Third World; the relationship between economic and ecological crises; environmental policy, democracy, and the state; ecological racism, sexism, and classism; and the crisis of social movements in the U.S.

SOC 3130 Sociology of Violence

An examination of the roots and consequences of violent behavior in society and the individual. Topics vary from quarter to quarter, but will include serial murder, massacres, hate crimes, workplace murder, group violence including cults, and mass media portrayals of violence.

SOC 3131 Political Economy of Capitalism

Constitutes the required core course in the political economy concentration and serves as a theoretical introduction to neo-Marxian political economy. Subjects of particular focus include historical materialism; the labor theory of value and elementary laws of capital accumulation; class, gender, race, and the division of labor; imperialism and underdevelopment; the state; political, economic, and social crisis theory; and debates concerning the restructuring of global capitalism.

SOC 3132 Cultural Studies I

This course introduces cultural studies as an interdisciplinary investigation of how modes and formations of difference among cultural practices are represented sociologically and historically in the social sciences and humanities. It is intended to elucidate debates among the various critical disciplines of the "human sciences" in regard to recent changes in the meaning and use of the term "culture" in history, sociology, literature, cinema studies, and politics. The form of this inquiry is critical. By this is meant (1) that theory and method are conceived of qualitatively and as moments of conceptualization and self-reflection; and (2) that the course draws on various literatures that now operate critically and self-critically at the intersection of the various academic fields, including dialectics, structuralism and its critical variants, feminist theory, and writings on post-colonialism.

SOC 3133 American Demographics

Overviews major areas of demography including migration, fertility, population growth, and household transitions. These processes are studied in the context of social and economic changes with an emphasis on societal consequences and social and economic policy.

SOC 3135 Issues in Social Psychology

Examines human behavior from a sociological and psychological perspective. Gives special consideration to such topics as gossip, and rumor, presentation of self, prejudice, and mass communication.

SOC 3147 Urban Sociology

Discusses theories of the development of urban life. Compares preindustrial and industrialized urban areas. Presents methods for the study of urban social structure and change, and evaluates contemporary metropolitan action programs.

SOC 3148 Boston Seminar

Studies urban development, including environmental and historical circumstances, demands for services, response to events, and programs. Examines basis for value system of Yankees, ethnics, and cosmopolitans, the impact on downtown and neighborhood relations, and metropolitan prospects.

SOC 3149 Metropolitan and Regional Issues

Analyzes problems, policies, programs, and activities associated with metropolitan and regional life. Includes assessment of values, institutions, networks, interest groups, decision making, service delivery, growth and development, environment, equity, and integration,. Presents case studies in societal context.

SOC 3155 The Family

Analyzes social structure and social functions of the family as a social institution. Includes comparative and historical examination of relations between the family, gender, and other institutions in society.

SOC 3160 Women, Men, and Social Change

The Industrial Revolution and the corresponding changes in the labor force and patterns of domestic life have altered the sexual division of labor. In post-industrial society new institutional forms are recasting personal relations. Examines these forces of social change and their impact on gender roles.

SOC 3165 Sociology of Education

Analyzes the structure and function of educational institutions, and presents student, faculty, and administrative perspectives. Emphasizes the role of education in process of socialization, social mobility, social change, and social control.

SOC 3166 Sociology and Anthropology in the Schools**4 QH**

For current and perspective teachers in sociology and anthropology at the precollege and community college levels. Offers participants the opportunity to analyze curricula in their fields and consider alternative rationales for various approaches to teaching sociology and anthropology at these levels. Focuses on the potential uses of sociological and anthropological concepts in analyzing and solving educational problems. Students are expected to present either a course or unit they have prepared or a project they have planned or conducted utilizing a sociological or anthropological perspective.

SOC 3170 Intergroup Relations

Examines the relations between various racial, national, cultural, and religious groups with emphasis on historical development. Pays particular attention to American society with its specific problems of adjustment and assimilation.

SOC 3175 Labor and Development

Examines the role of labor in the development processes of the global economy. Ethnographic studies of a variety of work settings in the international division of labor utilized.

SOC 3176 Sociology of Occupations and Professions

Studies the relations between the occupations and professions and society. Special topics may include occupational stratification, professional group behavior, recruitment and socialization of occupations and professions, and political activism.

SOC 3185 Sociology of Deviant Behavior

Analyzes theories of deviance (anomie, differential association, control, conflict and labeling). Examines their basic assumptions, focus, key concepts, general propositions, empirical support, strengths and weaknesses, and implications for social policy.

SOC 3186, SOC 3187 Social Control**1, 2****3 QH each**

Presents a seminar in research, theories, and methods in the sociology of social control.

SOC 3190 Sociology of Delinquency

Analyzes social and social psychological factors of delinquency and their implications for prevention, rehabilitation, and treatment.

SOC 3200 Sociology of Alcoholism

Studies the conditions under which people characterize alcoholics, responses to characterization, stages in drinking careers, and transformation of alcoholic identities. Examines the changing network of alcoholism treatment services in order to develop generalizations on the social organization of alcoholism.

SOC 3205 Sociology of Crime and Justice

Presents a sociological and legal analysis of the criminal justice system, concentrating on police and law enforcement; plea-bargaining; courtroom research and trial strategies; sentencing; and prisoners' rights and corrections. Considers the relationship of race, social class, and crime, as well as the sociological explanations of crime.

SOC 3206 Sociology of Law

Discusses the relationship among law, ethics, and social policy, with emphasis on such issues as family violence, the management of AIDS, state regulation of public morality, and health maintenance and the provision of medical care. The course has an applied focus and emphasizes student participation and initiatives.

SOC 3207 Family Violence

Discusses physical abuse and sexual abuse of children, spousal violence and elder abuse, with emphasis on social policy and legal intervention.

SOC 3215 Medical Sociology

Studies social aspects of illness and medicine, historically and cross-culturally. Focuses on illness and the medical profession in modern society and their structural settings: the community, the hospital, the medical school. Critically examines research studies in the field and specifies problems for future research.

SOC 3230 Ethnographic Theory

Ethnography is an approach mostly utilized in a "field setting," outside the university and its library. It calls for researchers to become directly involved or immersed in the everyday lives of individuals and/or groups in order to examine and explain the ways they subjectively perceive, feel, and give meaning to their world. This course's main objective is to teach you the practicalities, realities,

joys, and limitations of ethnography through the examination of some writings on ethnographies and a couple of actual ethnographies. *Prereq. Familiarity with field methods strongly advised.*

SOC 3240 Formal Organizations

Introduces and critically examines different theoretical approaches in an attempt to understand and explain how organizations work. Also it examines the implications of organizational goals, structure, and control on society as a whole and organizational members in particular.

SOC 3245 Sociology of Poverty

Analyzes sociological perspectives on causes of poverty, public views on poverty, and institutional responses to poverty. Emphasizes a concern with policy issues and implementation of policies. For advanced students in the social sciences and in the various human services schools in the University.

SOC 3286 Sociology of Science

Presents selected topics dealing with interactions between science and society.

SOC 3300 Special Issues in Sociology and Culture

Analyzes major contemporary theories, focusing on such themes as the relationship of criticism to theory, the dynamics of exchange and production in post-national economies, the socialization of "rational choice", the theoretical significance of postmodernity and difference, the relation of the historical to the social dimension of social organization, the interaction of power and discourse, the operations of gender within theory, and the significance of class, race, and gender to models of the global political economy.

SOC 3302 Feminist Methodologies

Feminist scholarship has challenged and reworked basic assumptions about the social world and the research that describes it. This requires three basic approaches: Rethinking, Reflecting, and Rewriting. To do this we need to examine the ways of knowing common to the social sciences and the ways in which new paradigms have or have not been integrated into the canons. Students are expected to do a close reading of the texts assigned and come prepared with questions and notes for the class meetings. In addition, one class presentation and one paper will be required.

SOC 3303 Economic Sociology

This course will review recent writings in economic sociology. Economic sociologists see social activity as embedded in social networks, institutional structures, history and culture, while classical economics tends to view economic actors as behaving rationally in relative social isolation. This scholarship traces its intellectual roots to Marx, Weber, Durkheim, Simmel, Schumpeter and Polanyi, while mainstream economists employ the lessons of Adam Smith, Ricardo, Mill, Marshall, Keynes and Samuelson.

SOC 3304 Feminist Theory

Considers major developments in feminist theory since the rise of the contemporary women's movement. First looks at early socialist feminist and radical feminist theory and critiques of them, psychoanalytical feminist theory, postmodern feminism and its critics, and theories about exclusion and difference among women, particularly by women of color. Gender, sexuality, and power are central categories of analysis.

SOC 3307 Foundations in Theory III 4 QH

This course is required for students in the PhD program who seek a comprehensive treatment of current developments in sociological theory. Among the schools that might be considered are: critical theory, modern Marxist theory, contemporary French theory, semiotics, hermeneutics, symbolic interactionist theory, and other emerging schools of thought. The specific content of the course changes periodically in order to keep the focus of the course on the new horizons in theory. The relation of theory to research is also a main goal of the course. Topics selected and announced by the instructor in advance. *Prereq. SOC 3100 and SOC 3101 or equiv. or permission of instructor.*

SOC 3310 Social and Cultural Change

Analyzes the changing patterns in social, economic, and political institutions. Discusses modern social trends. Two-quarter course in conjunction with anthropology.

SOC 3314 Law, Policy and Society

This course contrasts several major schools of thought about the relationships between law, public policy and social experience. The differing assumptions about the law in legal realism, social choice theory, law and economics, Marxism, critical legal studies, functionalism, conflict theory and natural law will be examined in order to reveal their theoretical bases and their policy-making

implications. Each school will be presented with attention to how its scholars claim to know what they know, how its theories are created, tested, and evaluated, the range of issues that are regarded as fit to study, and how research agendas are set.

SOC 3315 Cultural Studies II

This seminar focuses on issues having to do with the problematic connection between the social practices of representation (the relation of writing to idea) and practices of appropriation (the relation of knowing to reading). These two practices, at the heart of theoretical debates about the subject matter of Cultural Studies, will be discussed in the context of recent critical formulations of praxis, power, social formation, and self-reflection. The overall project of the seminar is to investigate the historiographical and sociological aspects of interdisciplinary convergences among the humanities and social sciences.

SOC 3317 Seminar in Urban Social Policies

This course offers an overview of the contemporary urban policy issues in the United States. It examines the relationship between economic and political forces and how these forces determine which of urban social issues will get priority over the others. The course uses case studies of specific urban social policies that were implemented in different cities, and discusses the possibilities for their nationwide implementation.

SOC 3320 Multiple Regression in Sociological Analysis

Focuses on techniques of sociological analysis based on multiple regression. For example, use of coded variables, trend analysis, covariance analysis, and path model testing. *Prereq. SOC 3115 and SOC 3117 or equiv.*

SOC 3321 Current Issues in Social Research

Examines selected topics in the methodology of social research. *Prereq. SOC 3116 and SOC 3117 or equiv. or permission of instructor.*

SOC 3325 Sociology of Policy and Evaluation

Introduces the social, political, and economic factors affecting policy formation and the eventual success or failure of social programs in health, education, and welfare. Stresses evaluation of policy alternatives and planning problems. For advanced students in the social sciences and in the various human service schools of the University.

SOC 3345 Community Analysis

Course explores various approaches to the study of community with a particular emphasis on the politics of development and on neighborhoods. Also it examines the importance of race, class, and ethnicity on emergence of new local social movements. Students are expected to do their own research project on specific community issue.

SOC 3360 Social Stratification

Places theories of inequality between groups in historical perspective, from classical to modern industrial times. Discusses and evaluates sociological research in social stratification with regard to different social and cultural groups. Emphasis on American Society.

SOC 3365 Social Movements

This course focuses on the women's movements that began in the late 1960s and then considers various political and theoretical developments in the more than twenty years since then. The goal is to consider the changes and reappraisals from the original social movement to more diverse and decentered movements, many based on identity, with the goal of constructing a fuller understanding of the range of oppositional theories, practices, and possibilities in contemporary American society.

SOC 3410, SOC 3411, SOC 3412, 3 QH each**SOC 3413 Contemporary Issues in Sociology**

Discusses contemporary issues in sociology. Includes supervised readings and written reports on special problems.

SOC 3483 Sociology of Science, Knowledge, and Technology

Interdisciplinary seminar on the sociology of scientific knowledge and its consequences. Topics include: The social construction of scientific knowledge and its use in controlling behavior and legitimating social inequality; the political economy of technology development and its cultural effects; the processes by which society assesses (or fails to assess) and regulates (or does not regulate) the social and environmental consequences of science and technology.

SOC 3485 Computers and Society

Offers a graduate seminar on the social impact of the computer "revolution" on the contemporary world. Topics include conditions of work, education, recreation, privacy, the computer science profession, paradigms of human thought, politics, and social change in the world economy.

SOC 3615 Tutorial in Teaching

Discusses issues and problems in teaching. This is a required course for all doctoral candidates and should be taken during a quarter when the student has major responsibility from designing and executing a course in either sociology or anthropology. Open to doctoral candidates only.

SOC 3620, SOC 3621, SOC 3622**Doctoral Proseminar****1 QH each**

Designed to help socialize doctoral candidates for participation as professional sociologists. Topics include the nature of intellectualism and the functions of an intellectual in society today, the university as a structure and as a community of scholars, the nature of professional organizations, teaching sociology, the organization of sociological ethics in the profession, and the nature of applied sociological work. Offers participants the opportunity to acquire practical experience in self-presentation and giving colloquia. Required of all doctoral candidates.

SOC 3798 Master's Continuation**0 QH****SOC 3799 Doctoral Dissertation Continuation****0 QH****SOC 3800, SOC 3801, SOC 3802, SOC 3804, SOC 3805****3 QH each****Directed Study in Sociology**

Comprises reading and research directed by a faculty member. Open to doctoral candidates only.

SOC 3803 Directed Study in Sociology**1 QH****SOC 3806 Directed Study in Sociology****4 QH****SOC 3807 Directed Study in Sociology****2 QH**

Comprises reading and research directed by a faculty member.

SOC 3810 Master's Paper in Sociology

Comprises empirical or library research meeting the criteria for publication in a professional journal. Supervised by members of the department.

SOC 3820 Doctoral Dissertation**0 QH**

The *Graduate School of Arts and Sciences Course Descriptions* should be used in conjunction with the *Undergraduate and Graduate Student Handbook*, *Cooperative Education Handbook*, and other procedural guides that contain Northeastern University's primary statements about academic programs, policies, and procedures; degree requirements; student responsibilities; student academic and curricular life; faculty rights and responsibilities; and general personnel policies, benefits, and services.

Mission Statement

Northeastern University is dedicated to providing a diverse student population with an academic program and a course of professional preparation of the highest quality. The University values equally knowledge for its own sake, knowledge as a means to success in the workplace, and knowledge as a cornerstone of personal achievement and satisfaction. As a private, urban university, Northeastern is determined to maintain its reputation as a friend to the city of Boston and a partner of the Commonwealth of Massachusetts.

Accreditation

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc., a nongovernmental, nationally recognized organization, whose affiliated institutions include elementary schools through collegiate institutions offering post-graduate instruction.

Accreditation of an institution by the New England Association indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer-group review process. An accredited school or college is one that has available the necessary resources to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the New England Association is not partial but applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

Inquiries regarding the status of an institution's accreditation by the New England Association should be directed to the administrative staff of the school or college. Individuals may also contact the New England Association of Schools and Colleges, The Sanborn House, 15 High Street, Winchester, Massachusetts 01890, 617-729-6762.

Delivery of Services

Northeastern University assumes no liability for delay or failure to provide educational or other services or facilities due to causes beyond its reasonable control. Causes include, without limitation, power failure, fire, strikes by University employees or others, damage by natural elements, and acts of public authorities. The University will, however, exert reasonable efforts, when it judges them to be appropriate, to provide comparable services, facilities, or performance; but its inability or failure to do so shall not subject the University to liability.

Northeastern University reserves the sole right to promulgate and change rules and regulations and to make changes of any nature in its program; calendar; admissions policies, procedures, and standards; degree requirements; fees; and academic schedule whenever necessary or desirable, including, without limitation, changes in course content and class schedule, the cancellation of scheduled classes and other academic activities, and the substitution of alternatives for scheduled classes and other academic activities. In any such case, the University will give whatever notice is reasonably practical.

Northeastern University will endeavor to make available to its students a fine education and a stimulating and congenial environment. However, the quality and rate of progress of an individual's academic career and professional advancement upon completion of a degree or program are largely dependent on his or her own abilities, commitment, and effort. In many professions and occupations, there are also requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These requirements may change while a student is enrolled in a program and may vary from state to state or country to country. Although the University stands ready to help its students find out about requirements and changes in them, it is the student's responsibility to initiate the inquiry.

Tuition and Fee Policy

Tuition rates, all fees, rules and regulations, courses and course content are subject to revision by the President and the Board of Trustees at any time.

Tuition Default Policy

In cases where the student defaults on his/her tuition, the student shall be liable for the outstanding tuition and all reasonable associated collection costs incurred by the University, including attorneys' fees.

Disability Resource Center

The Disability Resource Center provides a variety of disability-related services and accommodations to Northeastern University's students and employees with disabilities.

Northeastern University's compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 are coordinated by the Dean and Director of the Disability Resource Center. Persons requiring information regarding the Disability Resource Center should contact Dean G. Ruth Bork at 617-373-2675 (voice) or 617-373-2730 (TTY).

Equal Opportunity Policy

Northeastern University does not discriminate on the basis of race, color, religion, sex, sexual orientation, age, national origin, disability, or veteran status in admission to, access to, treatment in, or employment in its programs and activities. In addition, Northeastern University will not condone any form of sexual harassment. Handbooks containing the University's nondiscrimination policies and its grievance procedures are available in the Office of Affirmative Action, 175 Richards Hall. Inquiries regarding the University's nondiscrimination policies may be directed to:

Office of Affirmative Action
175 Richards Hall
Northeastern University
Boston, Massachusetts 02115
617-373-2133

Inquiries concerning the application of nondiscrimination policies may also be referred to the Regional Director, Office for Civil Rights, United States Department of Education, J.W. McCormack Building, Post Office Court House, Room 222, Boston, Massachusetts 02109-4557.

Family Educational Rights and Privacy Act

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records wherever appropriate and to challenge specific parts of them when they feel it necessary to do so. Specific details of the law as it applies to the University are printed in the *Undergraduate and Graduate Student Handbook* and are distributed annually at the registrations for the University's colleges and graduate schools.

Emergency Closing of the University

Northeastern University has made arrangements to notify students, faculty, and staff by radio and television when it becomes necessary to cancel classes because of extremely inclement weather. AM stations WBZ (1030) and WRKO (680), and FM stations WBUR (90.9), WBMX (98.5), and WFNX (101.7) are the radio stations authorized to announce the University's decision to close. Television stations WBZ-TV4, WCVB-TV5, and WHDH-TV7 will also report cancellations. Since instructional television courses originate from live or broadcast facilities at the University, neither the classes nor the courier service operates when the University is closed. Please listen to the radio or television to determine whether the University will be closed.

If a storm occurs at night, the announcement of University closing is given to the radio stations at approximately 6 am. Classes are generally canceled for that entire day and evening at all campus locations unless stated otherwise. When a storm begins late in the day, cancellations of evening classes may be announced. This announcement is usually made between 2-3 pm.

Registration Information

In order to register for courses outside your graduate school, you must meet the requirements of the school offering the course(s) as well as your home school.

Published 07/97

